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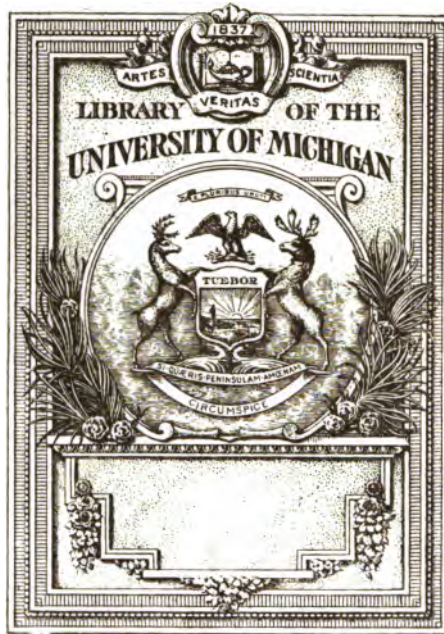
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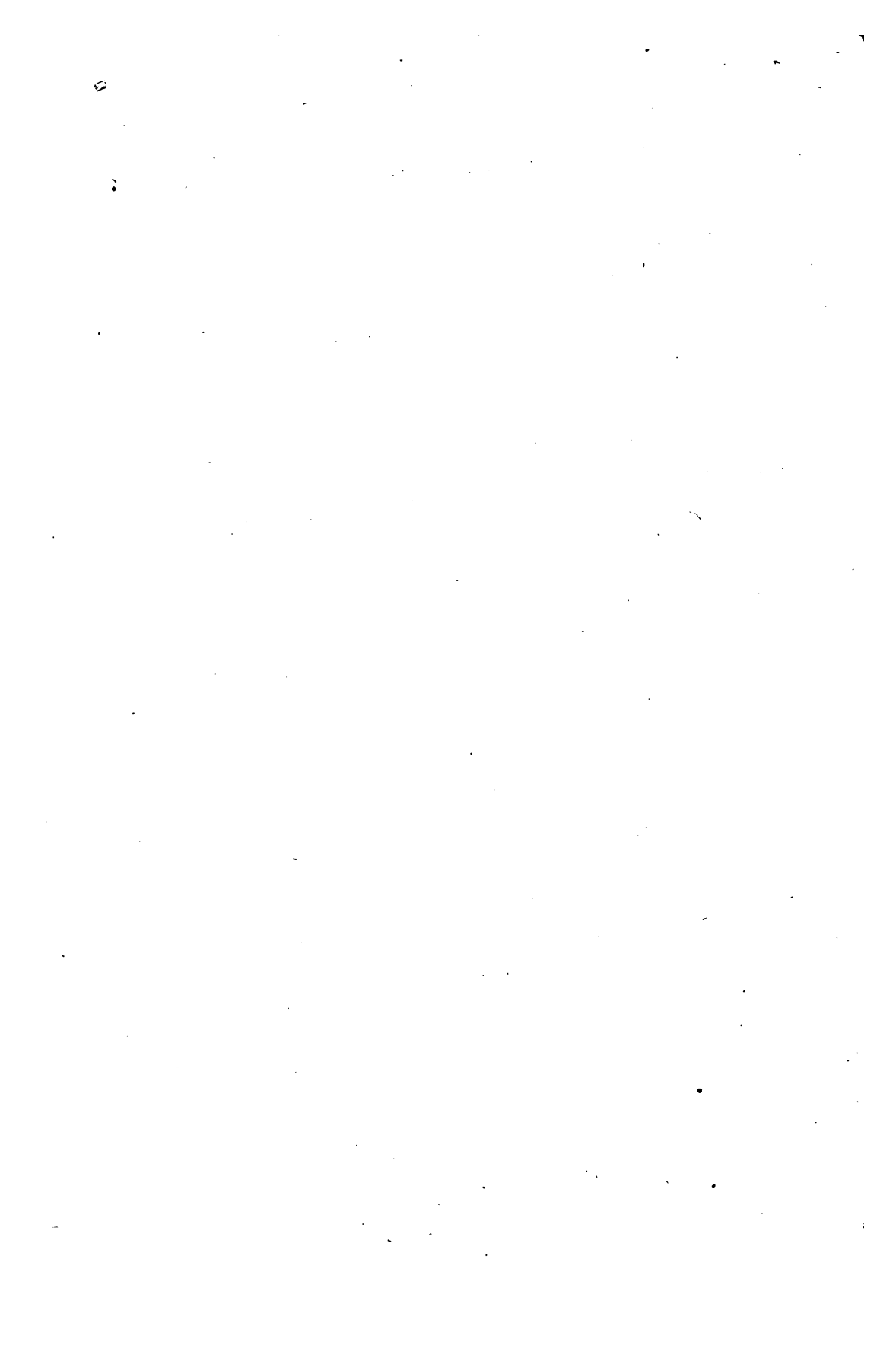
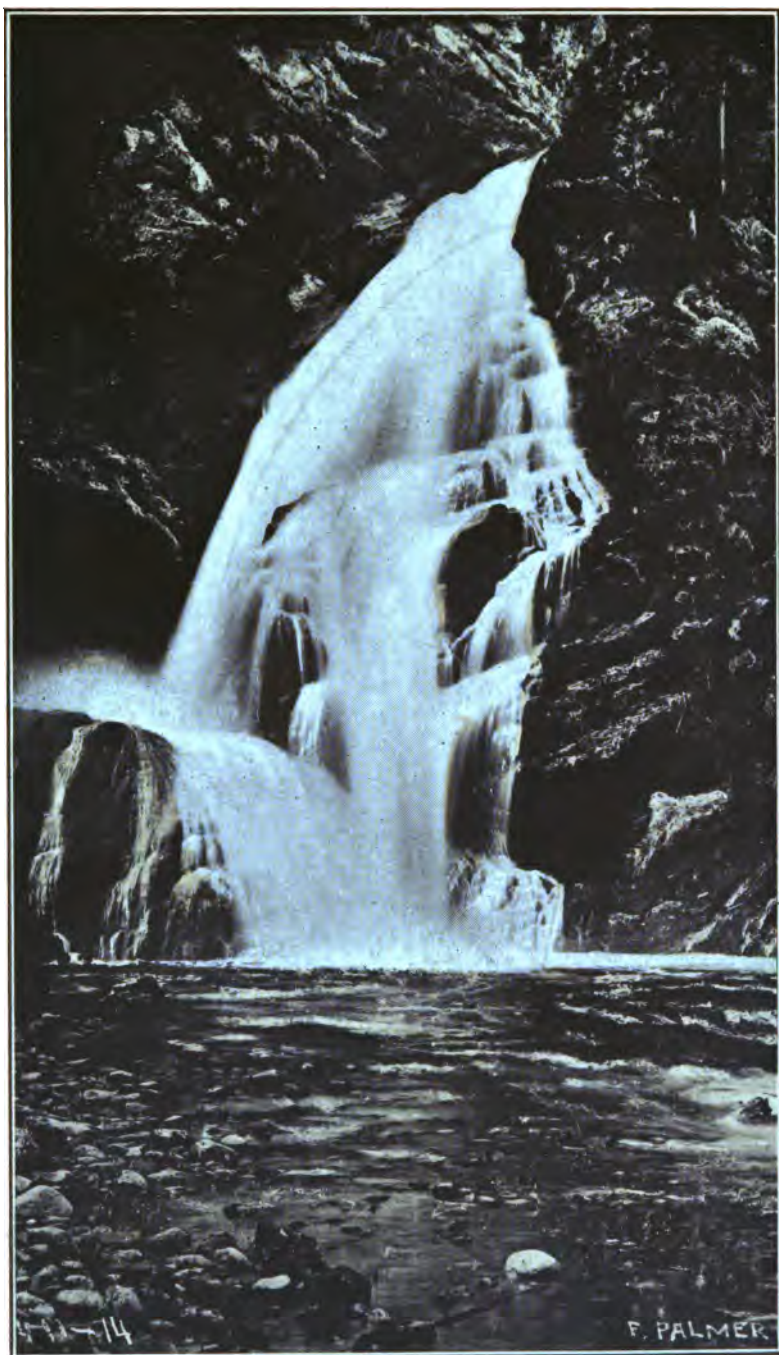


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A WASHINGTON MOUNTAIN STREAM

STATE OF WASHINGTON
DEPARTMENT OF STATE

Bureau of Statistics and Immigration

I. M. HOWELL, Secretary of State
Ex-Officio Commissioner

THE IRRIGATED LANDS
OF THE
STATE OF WASHINGTON

By GEO. M. ALLEN
Deputy Commissioner



OLYMPIA, WASH.:
E. L. BOARDMAN, PUBLIC PRINTER.
1910.



VIEW OF WENATCHEE VALLEY, WILLIAM TURNER'S RANCH IN THE FOREGROUND.

LETTER OF TRANSMITTAL

OFFICE OF THE
BUREAU OF STATISTICS AND IMMIGRATION.
OLYMPIA, Sept. 20, 1910.

Hon. I. M. Howell, Ex-officio Commissioner:

SIR—Pursuant to your instructions, I have prepared and have the honor to transmit herewith a report dealing with the irrigated lands of this state, with a recommendation that an edition of 10,000 copies of same be published for general distribution in connection with the work of this department.

Respectfully,

GEO. M. ALLEN,
Deputy Commissioner.

Approved for publication, October 1, 1910.

I. M. HOWELL,
Ex-officio Commissioner.



LONGVIEW RANCH, WENATCHEE VALLEY

LONGVIEW RANCH, WENATCHEE VALLEY, CHELAN COUNTY.

FOREWORD

It is quite within the range of possibilities that the products of the irrigated lands of Washington will in time exceed in annual value the present output from our combined timber and cereal-producing areas. Inasmuch as the forest and grain products aggregate not less than \$100,000,000 in value each year, this statement might, at first thought, be viewed as one born of undue enthusiasm. Regarded in the light of the facts, however, it would appear conservative.

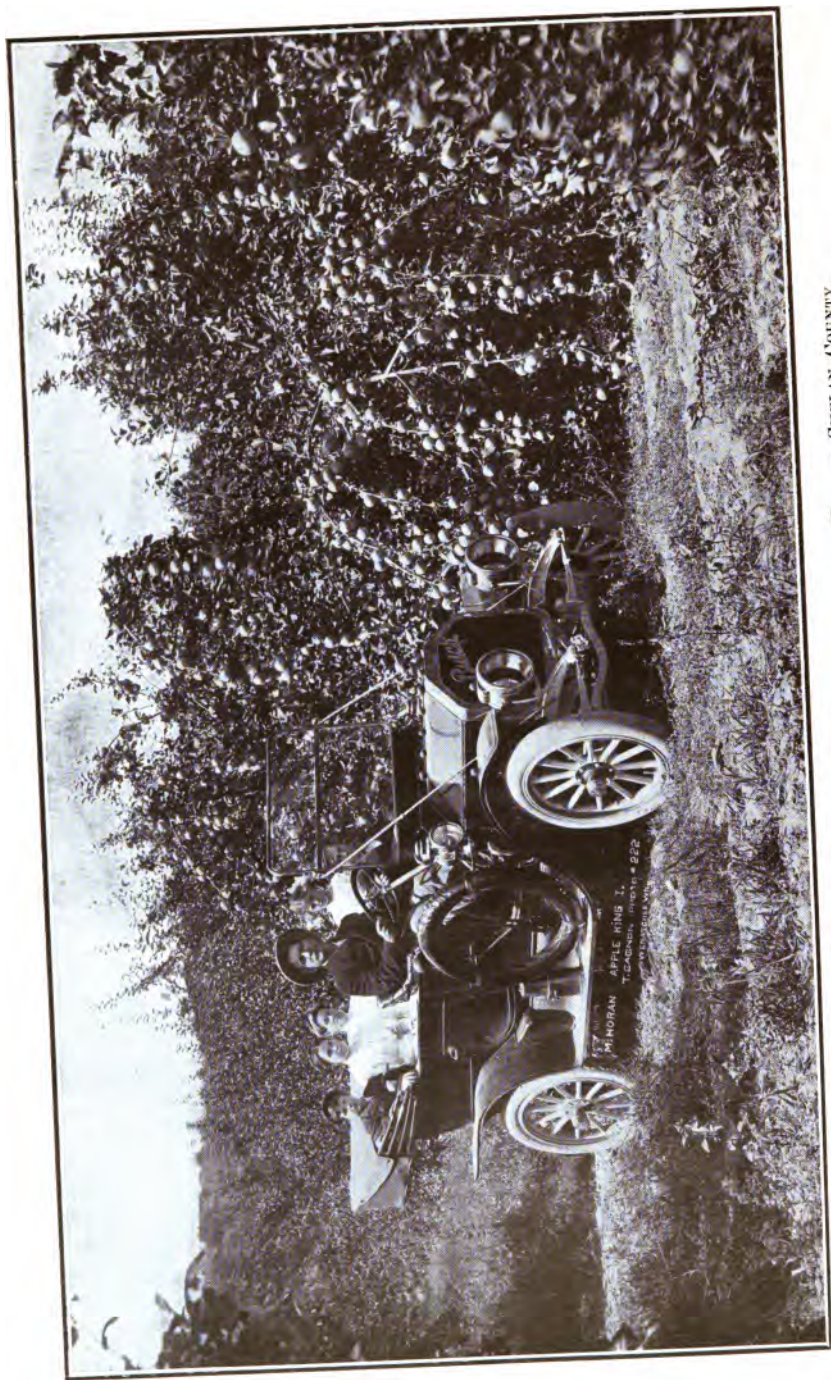
Careful authorities have estimated that the total irrigable lands of the state exceed 2,000,000 acres in area, of which not more than twenty-five per cent. have thus far been reclaimed. With this entire area productive, to secure a yield of \$100,000,000 in value annually would require only an average of \$50.00 per acre—an amount far below the returns from lands now irrigated and which have reached the producing stage.

In this report an effort has been made to review the progress of irrigation in the state up to the present time and to assemble such facts as will be of assistance to homeseekers who may be in search of a location on irrigated lands. The development to date has been small in comparison with what will occur in the future. The activity of the federal reclamation service, coupled with that of private companies, will result in tens of thousands of acres of land being reclaimed and placed on the market within the next few years.

This situation has created an insistent demand upon the state authorities for information, which it is the purpose of this report to supply, in so far as is possible within its fixed limitations. It has not been possible within the scope of this pamphlet to describe every project and community in the irrigated districts, the aim being to make the report as reasonably representative of the various counties where irrigation is practiced as circumstances would admit.

Much of the data has been secured from field investigations and through reports of men actually engaged in the cultivation of irrigated lands. Government reports and other recognized authorities have also been freely consulted. It is believed, therefore, that the information presented will be found reliable and fairly comprehensive, and it is hoped the pamphlet will prove of service to many who may be looking to Washington irrigated lands for a new home location.

Special acknowledgement is due Mr. S. O. Jayne, irrigation expert of the United States department of agriculture, for valuable data supplied in preparing the map of irrigated and irrigable lands which is published herewith.



ORCHARD OF WINTER BANANA APPLES IN THE WENATCHEE VALLEY, CHELAN COUNTY.

THE IRRIGATED LANDS OF WASHINGTON

Generally speaking, the bulk of the irrigated lands of the state lies along the valleys of the streams which find their sources in the eastern slopes of the Cascade mountains. These rivers, chief among which are the Yakima, Wenatchee, Entiat, Methow and Salmon, traverse a series of valleys, once a waste of arid sagebrush lands. Now these same lands present in many places the aspect of one continuous garden and orchard, reaching for miles up and down the streams.

The proximity of these extensive arid sections to the mountain streams and the swift descent of the latter from their places of origin in the Cascades to their respective points of confluence with the Columbia river present a combination of natural conditions highly favorable to the development of extensive irrigation enterprises.

LANDS WATERED.

Not only the low lands immediately adjacent to the streams are thus brought within reach of gravity water flow, but the higher levels or bench lands are also irrigated in the same manner, the canals and flumes reaching such lands, often being visible, clinging to the cliffs several hundred feet above the stream level. To accomplish the watering of the high lands, it has been necessary to build immense reservoirs for impounding flood waters, to tunnel mountains in search of proper grades for carrying the canals, and to overcome many other obstacles requiring expert engineering skill.

In addition to the lands immediately tributary to the above mentioned streams, there are considerable irrigated areas located at various points along the Columbia river and in the country lying east of that stream, as well as vastly larger tracts that still remain unreclaimed. To a small extent irrigation is also practiced in western Washington. All of the above sections are treated elsewhere and in detail in this report.

METHODS OF IRRIGATION.

Various methods of irrigation have been devised where conditions were such as to preclude the possibility of securing gravity water. Pumping plants operated by electricity or gasoline are employed quite extensively. Such plants are common along the Columbia river and are also in frequent use at points away from the streams where well water is available reasonably close to the surface. On some of the streams, current wheels have also been found a useful and economical means of irrigating, where a small lift only is required. Irrigation



A RANCH SCENE IN THE ENTIAT VALLEY, CHELAN COUNTY.

by pumping bids fair to be undertaken on an extensive scale with the development of plants for the conversion of available water power into electrical energy.

CAPITAL REQUIRED.

The amount of ready money required to insure success to a person locating on irrigated lands depends largely upon the individual, the number of acres he desires to secure, his willingness to endure temporary hardships and his ability to support himself and family while his lands are non-producing. The development of a tract of irrigated land is not what is usually termed "a poor man's proposition." Raw land under ditch and ready for improvement will cost \$200.00 and upwards per acre. Usually it may be purchased on terms extending over a period of several years, but the man without means to make the first two or three payments will need to draw heavily on his ability as a "hustler" if he succeeds in meeting his obligations as they mature.

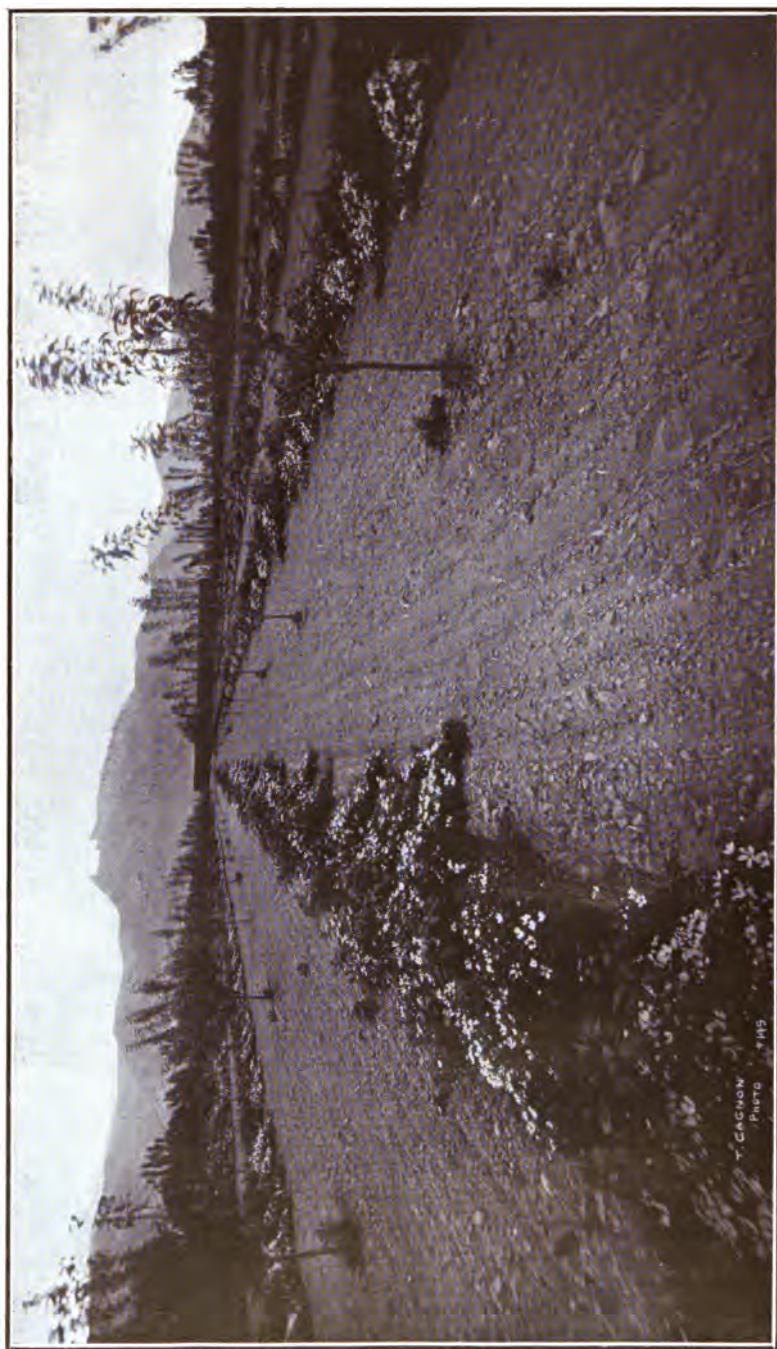
He must count also on the expense of clearing and planting his land, building a house, cost of farm implements, a horse or team and wagon, and when these are provided, he must look forward to a considerable period during which he will receive practically no direct returns from his land. Some men, it is true, have started in practically without ready resources, save an abundance of pluck, and ability to turn every opportunity to account, and have succeeded beyond their expectations; but they are in the minority. An available capital of \$2,000.00 is none too much to start with, and the settler's prospects of success will be augmented in proportion as his cash resources are greater.

SPECIAL ADVANTAGES.

As an offset to the somewhat onerous conditions enumerated above, the man who locates on Washington irrigated land enjoys certain advantages to which the average farmer is a stranger. If he has exercised ordinary judgment in the selection of his land, the element of chance is largely eliminated from his field of operations. His relation to his land may be likened to that of a manufacturer to his plant. His raw materials are in the soil and in the moisture supply which is independent of natural precipitation and available for use at a moment's notice. In the warm sunshine, continuing at times for six months without interruption, he finds the motive force necessary for transforming his raw material into the manufactured article. His crop ready for shipment represents his finished product, the selling qualities of which are largely governed by the skill and energy he applies in its growth and the preparation for market.

If his soil lacks any of the essential elements that make for fertility and productiveness, he can call to his aid the experience of state and federal experts, who will advise him as to the best method of meeting his particular problem. The same advantage holds good with reference to the garden and orchard pests he will encounter. Remedies have been

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DEWBERRIES PLANTED BETWEEN ROWS OF APPLE TREES, CHELAN COUNTY, NEAR WENATCHEE.

1000

found for practically all of them, and the proper authorities will instruct him in their application.

If he possess initiative and a desire to experiment, he may originate improved methods and economies which will work to his financial betterment. In any event, his work will provide him a constant mental stimulus as well as a field for physical effort, and all the advantages will accrue to him that are inherent in a life of out-door activity.

To the foregoing should be added the fact that the irrigated sections within a few years become thickly settled. Twenty acres constitute a large holding, and the tendency is in the direction of five- and ten-acre tracts to the family. Neighbors, in consequence, are close at hand, rural mail delivery is generally established, good roadways are constructed, improved railroad facilities induced, while schools and churches are always readily accessible. In short, the social side of life, throughout the irrigated districts, will be found developed on a sane, wholesome basis.

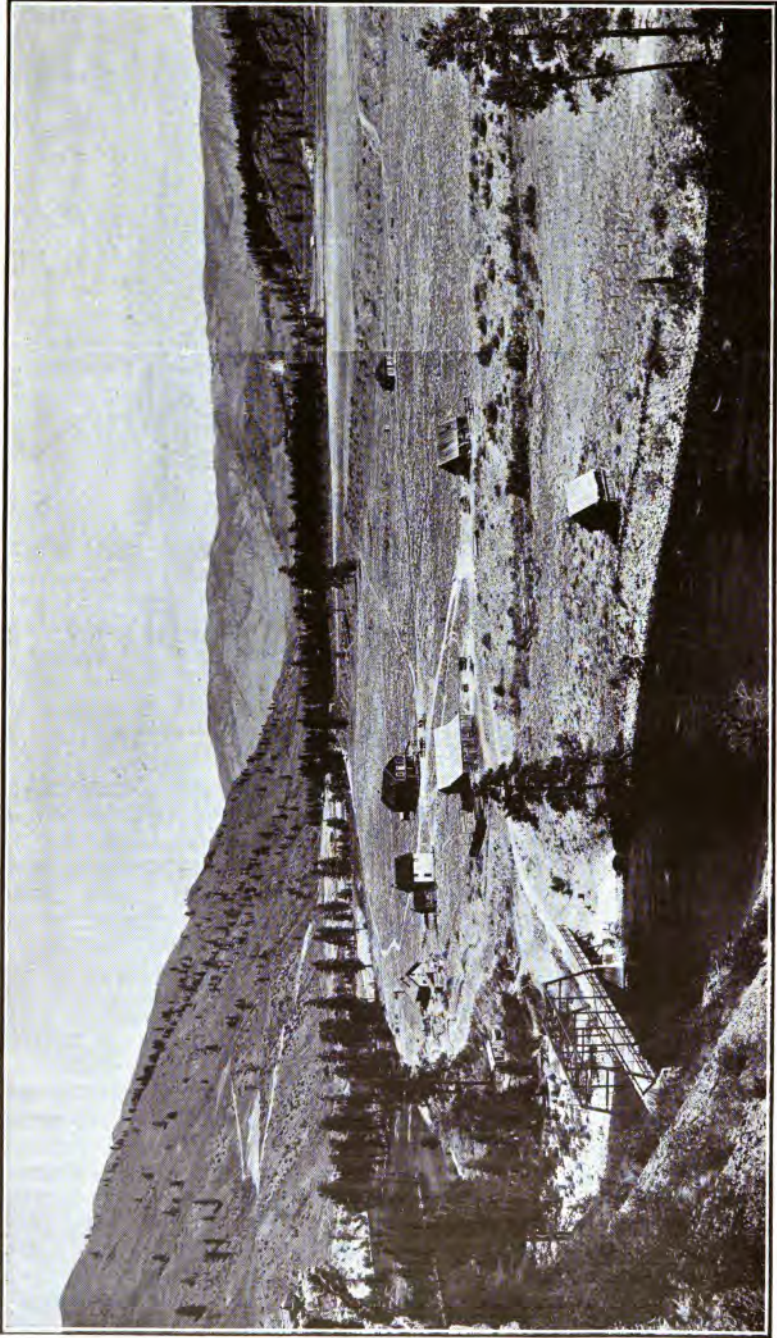
SELECTING A LOCATION.

The best suggestion that can be given upon the above point is for each person to make an investigation for himself and find a location that will best suit his particular requirements or purposes. It is not safe, under any circumstances, to buy land without having first seen it, or, in any event, without having a report from some person of good judgment and established reliability. Inferior tracts may be found in the best districts, and the only way to make sure of avoiding such locations is to secure first-hand information before purchasing.

There are a number of companies developing fruit lands in the state that undertake to plant the tracts they sell and care for same until the bearing period is reached. Where the responsibility of the company is fully established and the land is known to be adapted to the purpose, this plan of securing land may be profitably followed. The chief advantage lies in the fact that the purchaser may continue at his customary vocation during the period his land is non-productive.

SOIL.

The soil of the irrigated districts is in the main similar to that which is characteristic of eastern Washington as a whole. It is composed largely of a mixture of ash or dust of volcanic origin, sedimentary deposits washed down from the mountains and surrounding hills, and disintegrated basaltic rocks which through the ages have undergone a pulverizing process. Combined with accretions of decayed organic matter in varying quantities, it possesses great fertility, is remarkable for its moisture-retaining qualities, and is easily and readily tilled. It occurs in different depths, ranging from three feet to sixty feet, and there is often found an underlying strata of gravel providing ready drainage. In response to the application of water, it yields prolifically of all manner of products common to temperate and semi-tropical climates.



CARLTON FLAT, IN THE METHOW VALLEY, OKANOGAN COUNTY.

CLIMATE.

Inasmuch as different points in the section of the state under consideration vary widely in altitude, it is difficult to generalize with reference to climatic conditions. The characteristics are dry, hot summers and moderately cold winters, with a snowfall varying from a few inches to several feet. At times extremes both of heat and cold are experienced. The absence of moisture from the atmosphere operates against excessive discomfort from the heat, and the summer nights usually bring a pleasing coolness. The spring and autumn seasons are delightful, the only annoying feature being the prevailing winds, which lose much of their unpleasantness, however, as the area of orchards increases. The accompanying tabulations from reports of the United States weather bureau present detailed climatic data covering numerous points in the district:

FROST DATA FOR EASTERN WASHINGTON.

(From Report of U. S. Weather Bureau).

Stations.	Length of record	Average date first killing frost in autumn	Average date last killing frost in spring	Earliest date killing frost in autumn	Latest date killing frost in spring
Okanogan Country—	Yrs				
Conconully	9	September 21	May 18	September 10	June 23
Colville Country—					
Colville.....	9	September 7	June 5	August 21	July 26
Republic.....	8	September 8	June 15	August 26	July 29
Spokane Country—					
Crescent	9	September 22	May 23	September 11	June 25
Spokane	28	October 14	March 26	September 7	June 8
Chelan Country—					
Lakeside	16	October 19	April 10	September 25	May 4
Wenatchee (near).....	10	October 21	April 30	October 1	May 21
Big Bend Country—					
Waterville.....	16	September 20	May 31	August 26	June 25
Wilbur.....	9	September 6	June 23	August 17	July 30
Palouse Country—					
Colfax	13	September 10	May 25	August 26	July 26
Rosalia.....	9	September 14	June 1	August 26	June 24
Walla Walla and Snake River Country—					
Walla Walla.....	23	November 3	April 1	September 28	May 3
Zindel.....	7	October 29	April 14	October 19	May 21
Yakima Valley—					
Cle Elum.....	9	September 7	June 9	August 12	July 26
Ellensburg.....	15	September 21	May 23	September 6	June 6
Moxee.....	16	September 21	May 23	September 6	June 14
Sunnyside	9	October 8	May 7	September 25	June 2
Upper Columbia Val.—					
Kennewick.....	7	October 15	April 28	September 25	May 25
Lyle.....	16	October 18	April 23	September 21	May 18



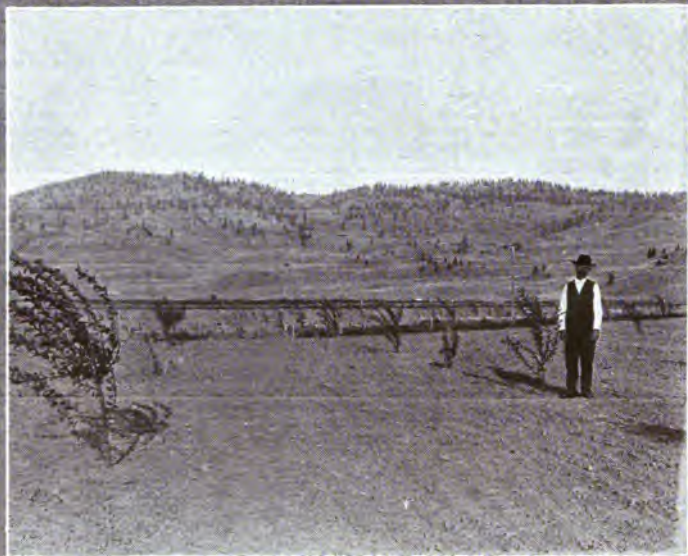
AN IMPROVED RANCH IN THE METHOW VALLEY, OKANOGAN COUNTY.

CLIMATOLOGICAL DATA FOR EASTERN WASHINGTON FOR THE YEAR 1908.

(Compiled from report of U. S. Weather Bureau.)

Stations.	County.	Temperature (degrees Fahrenheit).				Precipitation (inches).				No. rainy days ...	Sky.			Prevailing direction of wind....
		Annual mean.	Highest.....	Date.	Lowest.....	Date.	Length of record, yrs.	Total for the year.....	Greatest monthly....	Month.....	Least monthly....	Month.....	Totals snowfall	
Chapaca.....H8	Okanogan	1,200	107	July 31	0	Feb. 2	1	18.74	2.82	Oct.	10	Sept.	29.5	No. cloudy days.....
Cheney.....S1	Spokane	1,351	45.3	Feb. 1	-6	Feb. 1	10	19.15	4.04	Mar.	22	Sept.	33.0	No. partly cloudy days.....
Colfax.....T2	Kittitas	1,330	48	July 19	-15	Feb. 1	20	13.12	2.77	Feb.	22	Sept.	33.0	No. clear days.....
Colville.....	Whitman	2,339	43.8	July 31	-12	Jan. 31	9	13.42	2.26	May	12	Sept.	37.8	
Conconully.....	Okanogan	1,635	46.3	July 31	-10	Feb. 1	9	14.08	2.89	Oct.	22	June	15.2	
Dayton.....	Columbia	2,300	45.6	July 31	-4	Jan. 31	23	8.80	3.54	Oct.	04	Aug.†	19.9	
Ellensburg.....	Kittitas	1,700	51.6	July 20	-9	Feb. 1	6	8.10	1.67	July	01	Sept.	5.5	
Ephrata.....	Douglas	1,371	47.2	July 20	-3	Feb. 1	3	12.72	2.90	Oct.	01	Sept.	5.5	
Hatton.....	Adams	1,265	106	July 21	3	Feb. 1	14	7.69	1.36	Oct.	04	Aug.	23.0	
Huntsville.....	Columbia	1,400	51.6	July 21	5	Jan. 31	14	7.22	1.39	Oct.	09	Sept.	1.0	
Kennewick.....	Benton	1,367	55.1	July 21	5	Jan. 31	17	4.55	1.04	Oct.	08	Sept.	2.6	
Kiona.....	Benton	439	54.0	July 20	4	Feb. 1	18	18.89	3.10	May	08	Sept.	67.7	
Lakeside.....	Chelan	1,116	50.9	July 11	0	Feb. 1	16	12.36	2.61	Oct.	19	July	7.5	
Lytle (Pine Hill), T6S16	Klickitat	600	51.5	July 20	8	Jan. 31	9	14.29	2.51	May	05	Sept.	42.0	
Mottinger's Ranch.....	Benton	307	55.5	July 20	8	Jan. 31	17	31.4	1.08	July	02	Sept.	3.0	
Moxee (N. Yakima).....	Yakima	1,000	51.0	July 20	4	Feb. 1	12	12.02	2.30	Oct.	10	Sept.	28.6	
Northport.....H1S16	Stevens	1,960	42.7	July 11	-18	Feb. 1	15	4.75	1.27	July	0	Mar.†	13.2	
Pomeroy.....T3S6	Garfield	1,500	49.9	July 12	6	Feb. 1	15	4.38	1.44	Oct.	0	Sept.	2.5	
Pullman.....H10L18S14	Whitman	2,550	47.6	July 21	-8	Jan. 31	17	11.66	2.11	Oct.	22	Aug.	5.9	
Republic.....	Ferry	2,628	48.6	July 21	-20	Jan. 31	9	9.88	2.09	May	T	Sept.	29.2	
Rex Creek.....	Chelan	1,135	98	July 21	11	Feb. 1	2	110						
Rosalia.....	Whitman	2,270	99	July 31	-13	Jan. 31	17							
Six Prong.....	Klickitat	1,240	53.3	July 31	5	Feb. 1	2							
Spokane.....	Spokane	1,943	48.8	July 31	-4	Feb. 1	28							
Sunnyside.....	Yakima	740	104	July 31	3	Feb. 1	14							
Trinidad.....	Douglas	900	54.0	July 20	3	Feb. 1	5							
Twisp.....	Okanogan	1,619	106	July 21	-22	Feb. 1	6							
Wahluke.....H24L9S4	Douglas	410	54.3	July 21	3	Feb. 1	5							
Wallula.....	Walla Walla	1,000	54.4	July 20	2	Feb. 1	19							
Wauville.....	Douglas	2,624	105	July 20	-14	Feb. 1	23							
Wenatchee (near).....	Chelan	1,169	48.8	July 31	10	Feb. 1	10							
Zindol.....T5S 71	Asotin	715	57.2	July 30	9	Feb. 1	7							

Figures following name of station indicate number of days missing from record, and when accompanied by letters, indicate division of table to which figures apply, e. g., T4, four days missing from the temperature record; H, highest temperature; L, lowest temperature; R, range of temperature; P, precipitation; S, sky; W, wind. † Other dates also.



VIEWS ON THE GOVERNMENT PROJECT, OKANOGAN COUNTY.

THE IRRIGATED DISTRICTS BY COUNTIES

CHELAN COUNTY

Chelan county is located on the eastern slopes of the Cascade mountains, the summits of which constitute the county's western border. It extends eastward to the Columbia river, and the county's three important valleys, the Wenatchee, Entiat and Chelan, slope from the mountain peaks to the edge of the river. In these valleys, and more especially in the first named, the development of irrigated lands to a high productive state has been reduced almost to an exact science.

THE WENATCHEE VALLEY.

The Wenatchee valley has attained more than a local reputation as "The Home of the Big Red Apple" and as the section where "Dollars Grow on Trees," and an astonishing array of facts and figures may be assembled in support of the contentions expressed in these familiar slogans.

The line of the Great Northern railway, passing up this valley on its way to tidewater on Puget Sound, is bordered on both sides by an almost continuous succession of orchards, which cease only when the arable valley lands merge into the more rugged surface of the mountain sides.

INDIVIDUAL HOLDINGS SMALL.

The individual holdings are comparatively small, the tracts owned by a single family usually running five, ten or twenty acres. Excellent wagon and automobile roads traverse the valley, and a trip by motor or rig over its length gives one the impression of driving about the suburbs of some large city. Neighbors all along the route are close to each other, and everywhere there is manifest the evidences of a friendly rivalry in the beautification of home surroundings.

AREA IRRIGATED.

In the earlier days, small diversions of water were made by settlers who occupied the level lands along the river, for the purpose of irrigating their alfalfa fields. Some domestic orchards were incidentally set out, and the remarkable results obtained from these paved the way to the extensive scale upon which fruitraising as a commercial enterprise is conducted at the present time.

For a number of years, moneyed interests have been engaged in the construction and development of irrigation enterprises, and it is



VIEWS OF THE GOVERNMENT PROJECT, OKANOGAN COUNTY.

quite evident at the present time that within a very few years every available acre of irrigable land in the valley will be reclaimed.

In the district lying between Leavenworth and Rock Island on the Columbia river, and including several thousand acres on the east side of the Columbia river opposite Wenatchee, it is estimated that there are not less than 28,000 acres of land under irrigation.

WENATCHEE CANAL COMPANY.

Practically one-half of the above acreage is under the ditches of the Wenatchee Canal Company, which is now engaged in enlarging its high line canal in anticipation of supplying several thousand acres of bench lands with water. This company's operations extend the full length of the valley, reaching also across the Columbia river into Douglas county.

ICICLE DITCH.

What is known as the Old Mission canal is being replaced by a new ditch fed at Icicle creek, near the town of Leavenworth. The new project will cover the lands now watered by the Mission canal and an additional 2,000 acres. The lands are located between Leavenworth and Monitor, and the total length of the ditch will be 18 miles. It is being constructed on the most approved lines, involving the replacing, at intervals, of wooden flumes by tunnels driven through solid rock.

JONES-SHOTWELL DITCH.

Lands to the amount of 1,000 acres, located between Peshastin and Monitor, are watered by the Jones-Shotwell ditch. The water for the project is taken from Peshastin creek.

WENATCHEE WATER POWER COMPANY.

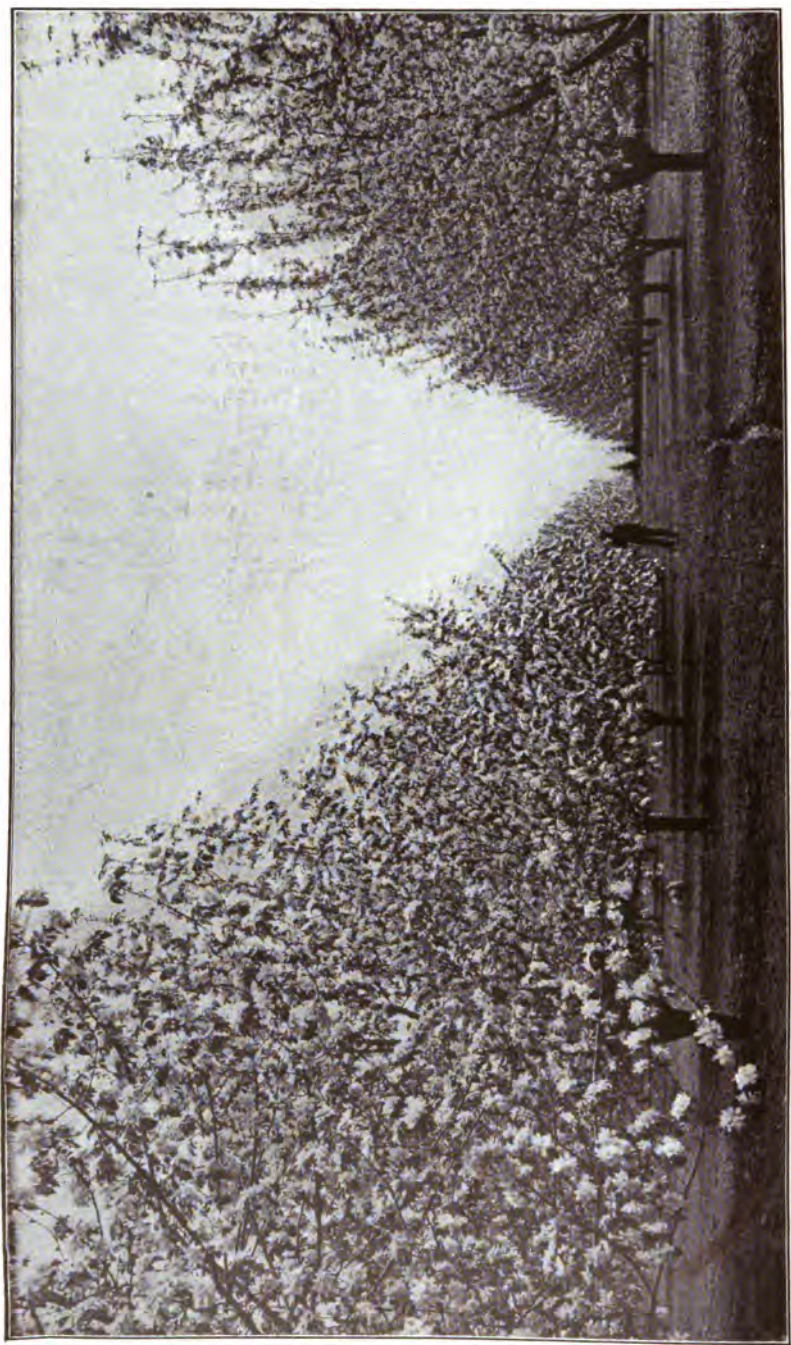
The above company's ditch, known also as the Gunn ditch, provides water for about 1,500 acres of land lying between the towns of Cashmere and Wenatchee. It is estimated that fully 80 per cent. of the orchards under this project are in bearing.

OTHER LANDS.

Centering about the little town of Cashmere is a thickly settled section of about 1,200 acres of land. This is one of the beauty spots of the Wenatchee valley, happily termed "The Vale of Cashmere." There is a diversification of effort here, fruitraising being supplemented by dairying, poultry-raising and gardening, the district as a whole presenting rural conditions almost ideal.

At Malaga, a fruit and hay district located seven miles south of Wenatchee on the Columbia river, is the Lockwood ditch, which waters 3,500 acres of land. This is one of the oldest ditches in the valley. Its water supply is obtained from Stemilt creek.

Near Leavenworth, several hundred acres of land are supplied with water through the Peters ditch.



AN OKANOGAN COUNTY ORCHARD IN BLOOM.

In addition to the areas above enumerated, there are many small tracts under private irrigation ditches, located in the numerous creek valleys and gulches which head into the Wenatchee valley proper. Some of these lands are supplied with water from live rivulets, others from springs and still others from small storage reservoirs in which the spring flood waters are impounded.

PRICES OF LANDS.

Prices of lands in the Wenatchee valley cover an extremely wide range. The prospective purchaser may exercise a choice extending from raw lands at \$400.00 and \$500.00 per acre to full bearing orchards for which selling prices have been recorded five and six times the above amounts. Under these conditions, he may regulate his purchase to suit his particular inclinations or the limitations of his resources.

ADVANTAGES.

In locating in this section, the homeseeker has the advantage of rail transportation both east and west, affording easy access to established markets extending from the Atlantic to the Pacific coasts. In addition, he will find himself in an environment where pioneer conditions have been met and overcome, where good schools and churches are at hand, with telephone and rural mail delivery established, and all the other accessories of our advanced civilization readily available.

In summer, the pine-covered slopes of nearby mountains, their lakes and streams filled with trout, offer a pleasant field for recreation, while but a short half day's trip over the range is Puget Sound with its myriad islands and 2,000 miles of shore line, one of the country's greatest summer playgrounds.

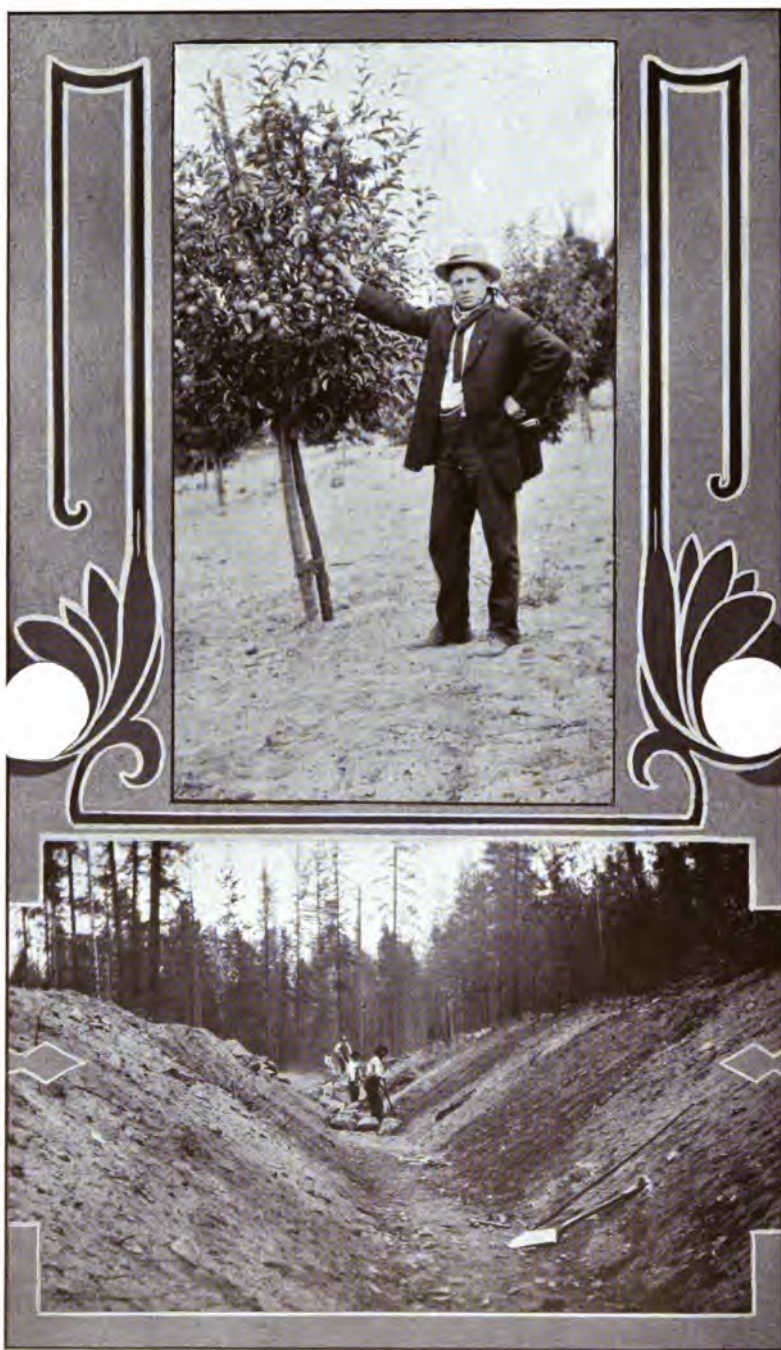
The growing city of Wenatchee, the metropolis of the valley, is easily reached from all points in the district. It is a thriving place, having advanced in a few years from a village to a trade and distributing center of commanding importance. The rapid growth of the city is bringing many metropolitan advantages within reach of residents of the valley.

THE ENTIAT VALLEY.

The Entiat river rises in the Cascade mountains 60 miles from its point of confluence with the Columbia, and is a typical mountain stream, having an average fall of 50 feet to the mile. The valley is exceptionally narrow, mountains towering on either side to a height ranging from 1,000 to 3,000 feet.

The fruit lands of the valley extend for a distance of about fifteen miles up the river from its mouth, and in many respects conditions of soil, climate, etc., are similar to those found in the valley of the Wenatchee. On the lower lands, near the river, peaches have been found to yield abundantly, while farther up the stream winter apples of fine quality and size are raised. At the Portland and St. Louis

THREE-YEAR-OLD APPLE TREE IN "UPPER COLUMBIA ORCHARDS," NEAR MARBLE,
STEVENS COUNTY.



A SECTION OF THE MAIN CANAL OF "UPPER COLUMBIA ORCHARDS" PROJECT, NEAR
MARBLE, STEVENS COUNTY, WASHINGTON.

expositions apples raised in this district were awarded gold medals and other prizes.

Above the fruit line the cultivated lands are devoted chiefly to hay production, timothy being the leading crop. There is a plentiful timber supply in this valley, and to its other advantages are added remarkable possibilities for power development.

LAKE CHELAN DISTRICT.

Adjoining the shores of Lake Chelan, and also occupying favorable locations in the nearby draws and gulches, are numerous fruit farms, many of which, however, have not as yet been brought under irrigation. Until within recent years, the theory was held by many that fruitgrowing in this district could be developed into a profitable industry, independent of any artificial water supply. The presence of moisture in greater or less quantities, supplied through sub-irrigation, was a known factor in the problem, and it was determined without much difficulty that trees would reach the bearing stage, independent of surface application of water.

Beyond that stage, however, results were uncertain, and trees after reaching an age of ten to twelve years frequently showed a tendency to weakness in production and other evidences of exhausted vitality. Under these circumstances, the fruitgrowers of the district began devising ways and means of irrigating their tracts. In some cases, power pumps have been installed, capable of lifting water from the lake to a considerable height on the nearby bench lands. Other growers have access to gulches or canyons, and by impounding their waters when in freshet secure a sufficient supply to insure maturing their crops.

IRRIGATION PROJECT.

At the present time an important irrigation project is being worked out, covering several thousand acres of land lying along the north shore of the lake a short distance west of the town of Chelan. The location with respect to the lake and mountains is delightful, and all the requisites of soil and climate are present to make fruitgrowing highly successful. The mild nature of the climate and the absence of late frosts have made it possible to grow peaches, apricots, English walnuts, etc., with great success.

TRANSPORTATION.

The problem of transportation is the most serious one that confronts the people of this section. The towns of Lakeside and Chelan are located side by side at the extreme eastern end of the lake, and the fruit lands are near by. The steamer landing on the Columbia river is four miles distant, and the wagon road is steep and narrow, involving a climb in its short length of about 300 feet. The traffic, at present, is cared for by stage and freight wagons. That improved transportation facilities will come in time is certain, particularly in



A TYPICAL ORCHARD SCENE ALONG THE COLUMBIA RIVER IN STEVENS COUNTY.

view of the fact that an immense power development is contemplated from Chelan falls.

LANDS NEAR RIVER MOUTH.

Near the mouth of the Chelan river is a splendid body of land well adapted to irrigation, but as yet undeveloped. A few miles farther south is a tract of several hundred acres now being brought under irrigation. Land here is plowed and set out in trees before being sold, prices ranging from \$350.00 per acre upwards.

A SUMMER RESORT.

Lake Chelan has long been famous as a summer resort, and annually attracts large numbers of tourists to enjoy its manifold advantages of boating, fishing, hunting, etc.

OKANOGAN COUNTY

THE METHOW VALLEY.

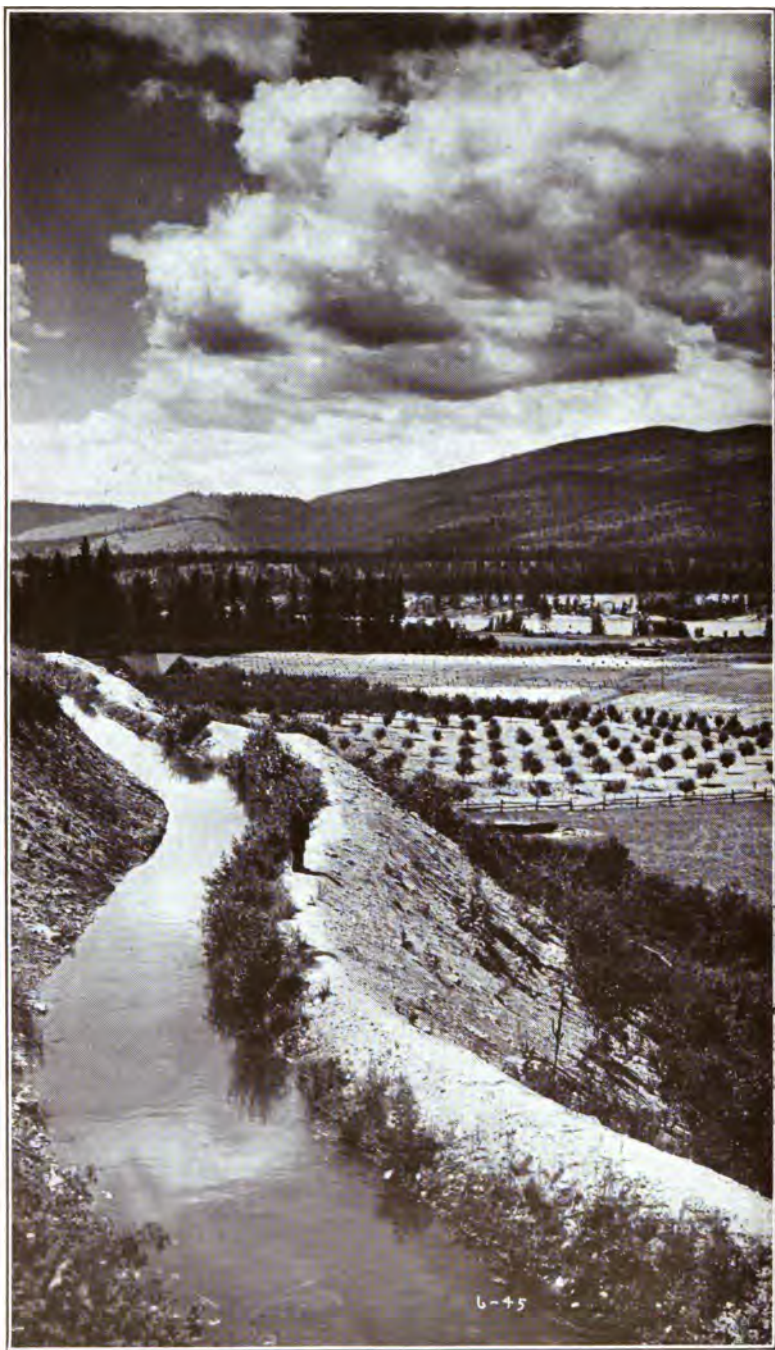
Sixty miles above the City of Wenatchee and almost at the point where the Columbia river makes its "Big Bend" to the eastward the waters of that stream are joined by those of the Methow river. Rising far up in the Cascade mountains, the Methow pursues a general south-easterly course, and towards its lower end runs almost parallel to the Okanogan river.

The Methow is a turbulent stream, averaging a drop of 25 feet to the mile and carrying a heavy volume of water throughout the irrigation season. The question of water supply will never become of serious moment in this valley, owing to the above fact, and there is an abundant surplusage to cover several other large irrigable sections lying along the Columbia and Okanogan rivers.

The valley attains a total length of about eighty miles, and for a distance of more than fifty miles the lands are splendidly adapted to a wide variety of agricultural purposes. In general the valley is narrow, seldom attaining a width in excess of two and one-half miles, and for much of its length being less than half as wide. In earlier days, stockraising was a leading industry, the natural grazing afforded by the hillsides being supplemented by remarkable yields of alfalfa on the lower lands. In later years corn has been found a profitable crop, while all manner of tree and small fruits and garden truck is extensively raised. Dairying is finding favor with many of the farmers, and several creameries are well supported.

IRRIGATION.

At the present time the valley is in a transition stage, the larger holdings being rapidly brought under irrigation and sold off in small



BONNY VALE DISTRICT, KETTLE FALLS VALLEY, STEVENS COUNTY.

tracts. It is still possible, however, to secure a quarter section in a single tract, and an occasional relinquishment of a homesteader's right is offered for sale.

A number of individuals, companies and associations of land owners have constructed irrigation ditches to water their lands, and others are making similar preparations. Such lands may be purchased under a variety of conditions. They may be bought outright for cash, or on installments, or by part payment of cash and the balance extending over a period of years. Some of the companies for an additional fee undertake to clear the land, plant it to trees and care for them until of bearing age. Where the purchaser does not wish to move immediately on the land, this plan is very satisfactory and has many advantages, provided full assurance of the responsibility of the company has been obtained.

It has been estimated that there are not less than thirty thousand acres of irrigable land in the valley, of which probably fifteen thousand acres are now being watered. Much of this is good fruit land, and thousands of apple trees have been planted during the past season. Domestic orchards have been producing in the valley for many years, and its fruitgrowing possibilities have been thoroughly established. There will always be a diversity of occupations in this valley, however, and its prestige as a producer of fat beef, alfalfa, corn and other products is not likely to diminish.

PRICES OF LANDS.

There is considerable range in the values of lands in this valley. Raw tracts without water may be found at \$60.00 to \$75.00 per acre, but generally the prices range higher. For lands under ditch, with a water-right, the prices vary from \$250.00 to \$350.00 per acre. By reason of the desire on the part of many of the older settlers to realize on their holdings and seek a newer environment, land may be purchased at times, under exceptionally favorable conditions.

TRANSPORTATION.

The Methow valley has suffered from a lack of transportation facilities, and there is as yet no definite information as to when this difficulty will be overcome. All traffic at present is by stage and freight team from Pateros, which is reached by the Columbia river steamers from Wenatchee, and is also the present southern terminus of the railway now building from Oroville. A railroad up the valley is a crying need and one almost certain to be supplied ere long. One of the principal state roads extends up the valley and is the highway over which the bulk of the traffic at present is borne.

IRRIGATION PROJECTS.

At the mouth of the river and touching also along the bank of the Columbia is a tract of 360 acres irrigated by the Pateros Water Ditch



RAISING POTATOES IN YOUNG ORCHARD, SPOKANE COUNTY.

Company. This land has been under ditch for nearly six years, and is almost entirely in fruit.

The Larrabee ditch supplies about 200 acres of land lying along the Methow from four to eight miles above Pateros. Construction work on this project is about completed.

Opposite the Larrabee holdings is the Vroman ditch, watering a small tract of land. At Black canyon and Squaw creek tracts of about 75 acres each are being irrigated.

Near the village of Methow is the Bolinger ditch, carrying double the amount of water necessary to irrigate the 400 acres it supplies. This ditch is built on permanent lines throughout its entire length of five miles. The property is being cut up into tracts at prices ranging from \$250.00 to \$300.00 per acre.

The Methow Canal Company irrigates 4,000 acres of land lying on both sides of the river below the town of Twisp. The main canal receives its water supply from the Twisp river at a point several miles above the town and follows the west side of the Methow. Some distance below Twisp a portion of the water is diverted through a pipe line and carried across the river to irrigate the lands on the east side. Practically all of this company's lands are under ditch and are being sold in small orchard tracts. A plan for the development and distribution of electric lights and power is under consideration by the company.

Adjoining Beaver creek, which enters the Methow from the east about twenty-eight miles above its mouth, there are nearly two thousand acres of land under irrigation. The lands lie on both sides of the creek and the water is supplied from a reservoir and canal built at the joint expense of the interested land-owners. Probably not to exceed two-thirds of the land irrigated is as yet under cultivation, and there is a limited additional acreage not yet watered.

Along Benson creek, a few miles below Beaver, there are several hundred acres of bench land under ditch and generally cultivated.

A few miles above Twisp is the Barclay project, comprising about 1,200 acres of land, of which approximately one-half is watered. The lands are located on the east side of the river and the point of water diversion is about six miles north of Twisp. Along the Twisp river there are four hundred acres watered, with an additional six hundred acres that will be irrigated later on.

THE UPPER METHOW COUNTRY.

Above Twisp, the valley broadens considerably, and, following the main stream from Winthrop northwest for a distance of 20 miles, the first flat averages a mile in width.

The Foghorn ditch, constructed some seven years ago, waters about 600 acres of land, beginning near Winthrop and extending several miles down stream.

Beginning at a point three miles above Winthrop, there are three small canals, each with a capacity for watering about 100 acres.



VIEWS IN THE BUSINESS SECTION OF THE CITY OF SPOKANE.

From Wolf creek, water has been diverted through several ditches for watering a total of 500 acres of private holdings.

Eight miles above Winthrop is the Rock View ditch, a neighborhood enterprise which supplies about 300 acres, with a capacity for double that amount. In a similar manner, 200 acres are watered some four miles nearer Winthrop.

On the North Fork, about nine miles from Winthrop, is the Sky Line project, designed to water 1,500 acres. When completed it will represent an expenditure of \$25,000.00.

The Fulton ditch, taking water from the North Fork, waters 220 acres of land, devoted chiefly to alfalfa.

Land to the extent of 1,300 acres will be watered by the Chiwak Canal Company's ditch, which is one of the important newer projects. The point of water diversion is eight miles above Winthrop, and the main canal attains a length of eleven miles. There are a number of additional smaller ditches along the river which increase the total irrigated area in this section by several hundred acres.

THE BREWSTER FLATS.

Extending north from the town of Brewster a distance of several miles, and reaching back from the Columbia and Okanogan rivers toward the foothills, lie the Brewster flats. These lands, comprising about 15,000 acres, present extremely favorable conditions for development under irrigation. With other areas lying contiguous to the Okanogan, Columbia and Methow rivers, they combine to make a total approximating 35,000 acres, all of which will undoubtedly be reclaimed within the next few years.

The Brewster flats, proper, formerly were a part of the state's school land, the bulk of them having passed into private ownership within the past two years. They consist of comparatively level bunchgrass benches, paralleling the river at elevations varying from a few feet to 500 feet above the river level.

A plan was formulated several years ago for reclaiming this whole district, but has not as yet been carried through to completion. It is proposed to construct a diversion weir in the Methow near the town of Twisp, where a supply of water is available sufficient to reach every part of the district with a gravity flow. When a practical plan for completing the project has been developed and financed, this section will advance very rapidly. At present there are some 2,000 acres watered, a large proportion of which is already in orchard. The soil is a sandy loam, liberally mixed with the volcanic ash characteristic of the region. A strata of gravel generally underlies the top soil at a depth ranging from two feet to eight feet, affording excellent drainage.

BREWSTER ORCHARDS COMPANY.

The Brewster Orchards Company is the owner of a tract of 144 acres, all of which has been planted to standard winter apples. The land adjoins the townsite of Brewster, lying between it and the river.



ALFALFA FIELD AND ORCHARD ON W. H. TOLLIVER'S FARM, NEAR EPHRATA,
GRANT COUNTY.

The trees on one-half of the tract are three years' old, and the balance were planted last spring. The varieties planted are Spitzenberg, Winesap and Newtown Pippins. Mr. A. L. Smith, part owner and superintendent of the orchard for the company, states that the above named are the proven varieties for this section. Winesaps are known to give a yield as prolific as the Ben Davis. Mr. Smith plants his trees at intervals of 30 feet in rows 26 feet apart, using Anjou pears as fillers. His trees have attained a remarkable growth for their age and give every promise of developing into strong and vigorous bearers. Domestic orchards in the neighborhood have been producing without failure for upwards of a score of years.

PRICES OF LANDS.

Raw lands without water-right may be purchased in the Brewster district at prices ranging about \$100.00 per acre, and, on account of the uncertainty as to when the lands will be watered, favorable investment and speculative opportunities are presented. For land under ditch or which can be watered from the existing canal, the price varies from \$250 to \$350 per acre, depending on location, freedom from surface rocks and general topography.

GOVERNMENT OKANOGAN PROJECT.

The above project comprises 10,000 acres of land lying along the west bank of the Okanogan river. The tract consists of a series of terraces or benches of what formerly were bunchgrass lands. The lower lands are only slightly above the river level, while the higher points reached by the supply ditch attain an elevation of 300 feet to 400 feet above the river. The lands irrigated extend up and down the river a distance of ten miles, reaching on the north the little town of Riverside, on the south the town of Okanogan and at a central location on the bank of the river is the rapidly-growing community of Omak.

This is the first project completed by the government in the state, and is regarded by experts as a model in stability of construction and in respect to economy of operation. The water for the lands is obtained from the Salmon river, which empties into the Okanogan near the south end of the project. To insure a plentiful supply, the flood waters of the stream are impounded in two reservoirs of earth-filled construction and located near the town of Conconully.

During the season of 1910, water was available for distribution upon 8,900 acres of land, about one-half of which is under cultivation. It is estimated that more than 4,000 acres have already been planted to apple trees, the chief varieties being Winesaps, Jonathans, Spitzenbergs, Rome Beauties and Newtown Pippins. The first two mentioned comprise about 75 per cent. of the total acreage planted.

As is customary in government irrigation enterprises, the federal



**RESERVOIR AND ORCHARD ON J. D. REARD'S IRRIGATED FARM, ONE MILE SOUTH OF
EPHRATA, GRANT COUNTY.**

authorities deal with the landowners through a Water Users' Association. No individual can hold more than 40 acres of land, and a condition of residence is provided whereby the owner must live upon or within 50 miles of the project. The government's charge for a water-right is \$65.00 per acre, payable in ten annual installments, without interest. Land values under the project range from \$250.00 to \$500.00 per acre, the latter price being asked for choice tracts, cleared and planted to orchard.

This project is unusually favored in respect to air drainage, elevation and other conditions which give assurance of immunity from late frosts. The famous Pogue orchard is located here, upon which peaches and apples have been raised for years without failure. The additional advantage of an incontestable water-right, obtained direct from the federal government, has appealed strongly to many home-seekers.

The new branch line of the Great Northern railway, now building from Oroville to Pateros, passes down the river opposite the project, and will afford a rail outlet to Spokane and eastern points. Another extension of the same system is building which ultimately will give access to coast ports in British Columbia. River steamers are in operation between Wenatchee and Brewster, and in the summer season run up as far as Riverside on the Okanogan.

The anticipated opening of the Colville Indian reservation will undoubtedly stimulate other transportation interests to build in this direction. There are several hundred acres of excellent land adjoining the limits of the project, which will be watered whenever land values advance sufficiently to warrant the additional expense involved.

OTHER OKANOGAN VALLEY LANDS.

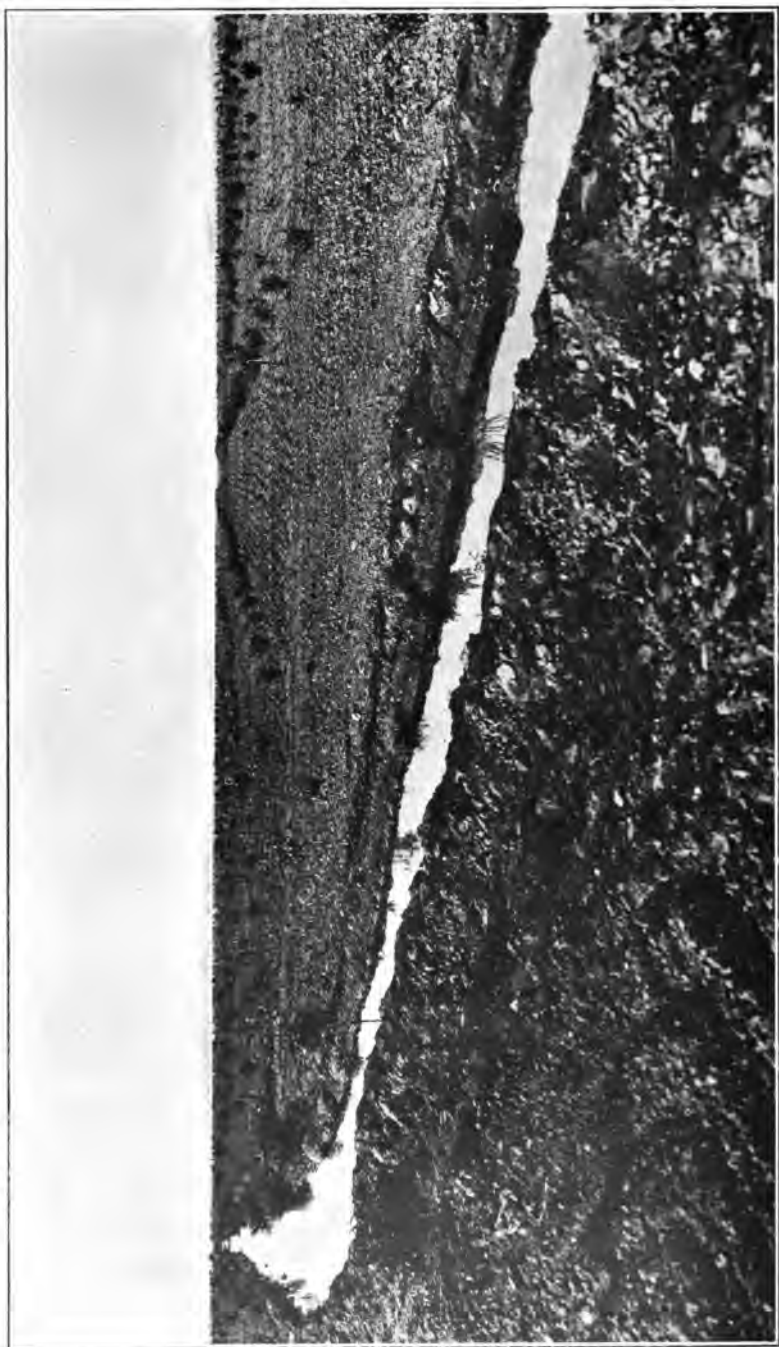
In addition to the projects and districts described somewhat in detail in the foregoing pages, there are numerous smaller irrigation enterprises in various stages of development, located up and down the entire length of the Okanogan valley.

The lowlands adjoining the river are receiving first attention, and reclamation of such tracts is proceeding very rapidly. The Okanogan river is a sluggish stream, having very little fall, and hence unsuited to the development of gravity systems of water distribution.

Some of the ranches along the river are irrigated from small creeks or from reservoirs built in neighboring canyons. Others, and the number of these is constantly growing, have installed pumps operated by gasoline, finding this a cheap and satisfactory method of watering their lands.

From Ophir to Malott there is a large acreage of irrigable lands, and near the latter point some 350 acres are under cultivation. West of Malott on the higher levels 500 acres have been irrigated by means of ditches supplied from storage reservoirs.

Further up on the Okanogan river, in fact along much of its course



PARTIAL VIEW OF CANAL AND ONE-YEAR-OLD APPLE ORCHARD, GRANT COUNTY, NEAR STRATFORD.

from Brewster to Oroville, many of the old alfalfa and stock ranches are now being divided up and sold off in small tracts. North of River-side the valley widens out and an occasional clump of pine trees adds variation to the scenery.

OROVILLE PROJECT.

The town of Oroville is located a few miles south of the international boundary line. It is on the line of the Great Northern branch which reaches Spokane on the east and will ultimately find outlets at Wenatchee and at Pacific Coast points in British Columbia.

Oroville at present is a railroad point of importance, in the center of expanding mining developments, and possesses all the characteristics of a busy western community. The population is about 500. On the east side of the river, directly opposite the town, and lying also along the shore of Lake Osoyoos, is a tract of 1,000 acres of land well suited to irrigation. A company has been organized for the purpose and will install a 100-horse-power pump, taking water direct from the lake. The company has begun active preparations looking toward the development of this property, and it is announced that their plans will be carried through to early completion. There are several other tracts of good lands in the vicinity of Oroville which in time will become productive under the stimulus of a plentiful water supply.

STEVENS COUNTY

Stevens county is located in the extreme northeastern section of the state, its chief physical features being the valleys of the Columbia and Colville rivers. The irrigated lands of the county are found chiefly along the borders of the first-named stream.

LOWER COLUMBIA.

South of Kettle Falls, where the country is generally open, irrigation has been in progress for a number of years. Some timber appears at intervals and the hills back from the river are well wooded, affording a plentiful timber supply.

The irrigated lands comprise a narrow strip along the river, where the soil is of a sandy loam, carrying a mixture of fine gravel.

The Fruitland Irrigation Company has completed a 7,000-acre project in this locality, taking their water from the Colville river, the length of ditch being 25 miles.

All grains, grasses, vegetables and many varieties of fruit produce abundantly in this section, small farms, irrigated from nearby creeks, having demonstrated its capabilities for all of the above products.



DOUGLAS COUNTY FRUIT.

The timbered hills protect the valley from unpleasant winds, and the climate on this account is more enjoyable than elsewhere.

Several other projects are being developed, and bench lands, as well as the bottoms, are being placed under irrigation. Farther down, and continuing in fact to the southern boundary of the county, irrigated tracts will be found, as advantages of soil and location have warranted.

UPPER COLUMBIA.

A second important irrigation district in Stevens county is located on both sides of the Columbia river, well up toward the international boundary line.

The lands lie in a series of benches which originally were covered with a growth of pine and tamarack timber. Several tracts, totaling 15,000 acres of irrigable land, are being opened here by the Upper Columbia Company. The first unit of 1,500 acres is now nearing completion. The lands extend from a point several miles north of the town of Northport in a general southwesterly direction to and some distance below the village of Marble. The method of irrigation is by gravity flow, the water being secured from Deep creek, Crown creek, Sheep creek, Onion creek, and other tributaries of the Columbia river. The elevation varies from 1250 feet to 1750 feet.

Apples have been raised in this section for years without irrigation, although the rainfall is not sufficient for maturing the fruit in perfect form.

SOIL AND CLIMATE.

The soil is gravelly, with a liberal percentage of loam and volcanic ash, and fruit trees and all manner of vegetation grow very rapidly.

The annual rainfall averages about 20 inches, and the company contracts call for the delivery of one acre foot of water per season. The rains occur chiefly during the spring months. Snow falls freely in winter, and there is usually 60 days of good sleighing. The scenery is relieved by wooded hills and mountains in the far background, and fish and game are abundant.

LAND VALUES.

Raw lands in Stevens county, with water-right, are held at prices ranging from \$250.00 to \$325.00 per acre, and where the operating company improves the lands with orchard trees and cares for same until the bearing period is reached, an additional charge of \$150.00 is made. Usually the lands may be purchased on terms, the payments extending over a period of several years.

TRANSPORTATION.

Rail transportation reaches Meyers Falls, providing for the district adjacent thereto, and in the Upper Columbia section the irrigated districts lie directly along the railroad, and shipping facilities in three directions are available.



VIEWS IN MOSES COULEE, DOUGLAS COUNTY.

SPOKANE COUNTY.

Spokane county is located in the extreme eastern section of the state, bordering on the Idaho line.

The northern portion of the county is somewhat mountainous, and is covered with a fine growth of pine and tamarack timber. Much of this section is suitable for agriculture, while all is adapted to grazing. The central part of the county is rolling and is traversed by the Spokane river. West of the city of Spokane there is much fine agricultural land, while to the east is the Spokane valley, which is rapidly being brought into a high state of cultivation by means of irrigation. There are about 40,000 acres in this valley capable of irrigation, of which a considerable portion has been reclaimed and is now under cultivation. The southern portion of the county is rolling, and comprises some of the finest agricultural land in the state. Large areas of this section are utilized for wheat-growing.

CITY OF SPOKANE.

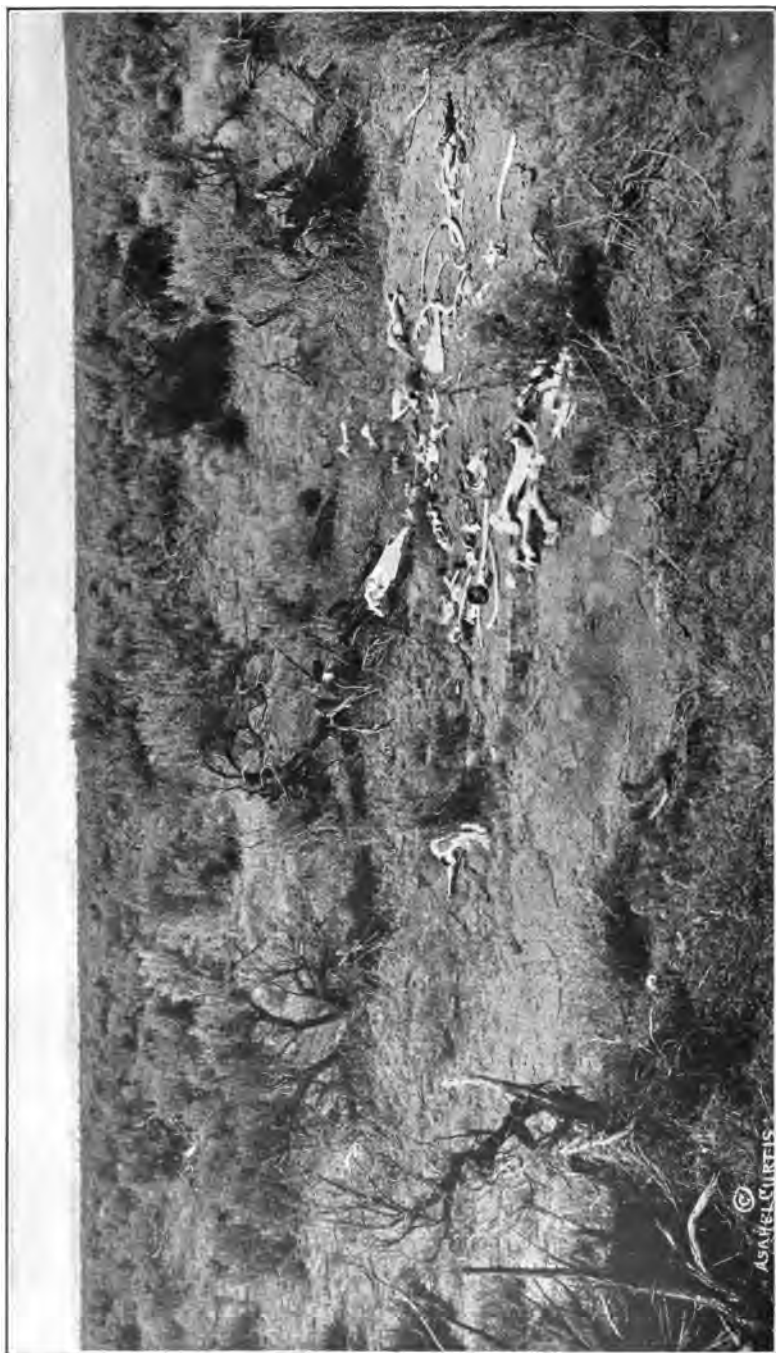
The city of Spokane, the metropolis of the "Inland Empire" country, is the county seat and is located on the Spokane river. The falls in the stream at this point have a drop of 132 feet, making possible the development of 33,000 minimum horse power. Spokane is the distributing center of a vast agricultural, mining and fruitgrowing district, and is one of the few large cities of the Pacific Northwest. Its manufacturing interests are expanding rapidly, their products including lumber, flour, machinery, agricultural implements, brick, pottery, iron products, cereal foods, furniture, etc. Transportation facilities are the best, including the Northern Pacific, Great Northern, Spokane Falls & Northern, O. R. & N., North Bank, and Milwaukee systems, in addition to a network of electric lines radiating from the city to different points in the tributary country. Spokane is the seat of the annual National Apple Show.

IRRIGATED LANDS.

The irrigated lands of the county, as already noted, are located chiefly in the valley of the Spokane river. They extend in a general easterly direction from the city of Spokane to the Idaho boundary line. North of Spokane well up towards the Stevens county line are other districts which are likewise being brought under irrigation.

SPOKANE VALLEY LAND & WATER COMPANY'S PROJECT.

The above company is developing 10,000 acres of land located in the valley of the Spokane river in Washington, and in Kootenai county, Idaho. The water for these lands is secured partly from the Spokane river and partly from Fish lake, Idaho. The Fish lake por-



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (a) THE UNDISTURBED SAGE BRUSH PLAIN.

tion of the system is completed, as is also the main part of the ditch, which is supplied with water from the Spokane river. The total main canal length is 22 miles.

These are prairie lands, most of which had been devoted to grain production prior to their development under irrigation. The soil is a black gravelly loam, producing fine crops of fruit, vegetables and alfalfa. The elevation ranges from 2,000 to 3,000 feet. The annual precipitation is greater than in most of the irrigated sections, and the amount of water supplied by artificial means is correspondingly less. The lands are located at distances ranging from five miles to twenty-five miles east from Spokane. Prices vary from \$150.00 to \$400.00 per acre.

SPokane CANAL COMPANY'S PROJECT.

This property comprises some 5,000 to 8,000 acres of Spokane valley land, water for irrigation being secured by gravity from Newman lake. A large portion of this land has been sold out and is in bearing orchards, producing extremely high quality commercial fruit. The varieties, generally speaking, are Wagener, Rome Beauty, and Jonathan. Land sells from \$350.00 to \$500.00 per acre, on terms of 25 per cent. cash and 25 per cent. each year until paid out.

OPPORTUNITY.

The irrigated lands at Opportunity comprise about 3,000 acres, and are located east of and not far distant from the city limits of Spokane. Water for irrigation purposes is obtained from wells, averaging about 100 feet in depth. Electric power is used in hoisting the water. A complete system for domestic water supply is also in operation, and electricity for lighting purposes is furnished the residents on the project. Some of the lands first sold in this district are now in bearing orchards, the chief varieties being Jonathan, Grimes Golden, Wagener, and Rome Beauty. Prices of land range from \$450.00 to \$550.00 per acre, while the annual maintenance fee is approximately \$5.00 per acre.

VERA PROJECT.

Some 5,000 acres of land are included within the above project, which lies directly east of Opportunity. For the most part, the same conditions apply to both districts. Water is supplied by pumping, and the soil is adapted to the same purposes as at Opportunity. Transportation is excellent, two steam, as also two electric lines, reaching the district.

HAZELWOOD IRRIGATED FARMS.

The above property lies westward from Spokane, and comprises about 2,500 acres of land lying at an elevation of about 2,200 feet. Water is supplied from Silver lake, and is raised to the required elevation by a huge pumping plant, capable of lifting 21,000 gallons per minute. A wooden stave pipe is utilized to convey the water to a basin,



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (b) CLEARING OFF THE SAGE BRUSH.

whence it is carried to the project through an open canal. An underground pipe system supplies the water direct to the individual tracts.

The soil here is a sandy loam, and prior to their development under irrigation the lands had for years produced good crops of different cereals. Apple and cherry orchards are being extensively developed.

ORCHARD AVENUE PROJECT.

The above project is located just eastward from the city of Spokane, bordering in fact upon the city limits. It has been platted into blocks or home-sites and is being developed as suburban property rather than as commercial orchard lands. The water is obtained from wells sunk to a depth of about 80 feet. Domestic water and electric lighting systems have been established, and the district is being improved with graded streets and cement sidewalks. This district may be reached in twenty minutes by electric car service from the center of the city.

ARCADIA LANDS.

The lands of the Arcadia Orchards Company are located about 22 miles north of Spokane. This district was originally covered with a timber growth, and the logged-off lands are being cleared and developed as garden and orchard tracts. The sources of water supply are Dragon creek and Loon and Deer lakes. One thousand acres have been planted to trees and large additional tracts are in preparation for planting.

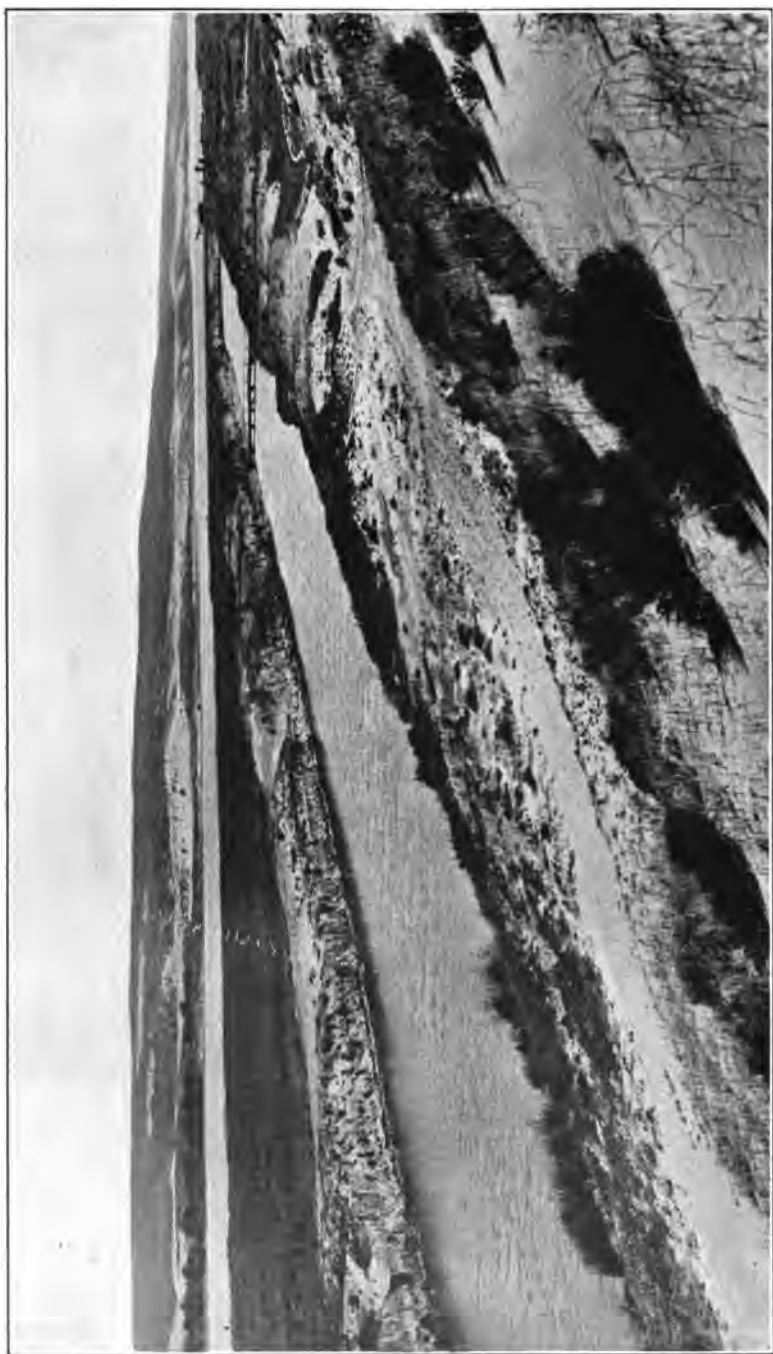
GRANT COUNTY

Grant county, in point of years, is the youngest county in the state, having been created by act of the last legislature from the limits of Douglas county. It is about equally youthful in respect to the development of its natural resources, which are, however, of much importance, and withal enjoying great possibilities for the future.

In contour, the county is a rolling, treeless plain, broken in places by depressions called coulees and by rather infrequent watercourses. It is essentially a district in the upbuilding of which irrigation is destined to play an extremely important part. In the southwestern portion of the county is a vast district, containing approximately 1,000 square miles of territory, wanting only the application of water to make it one of the most productive sections of the state.

TRANSPORTATION.

The Great Northern railway skirts the northern edge of this district. Paralleling the Great Northern, and 25 miles to the southward is the main line of the Milwaukee system. On the west is the Columbia river and to the eastward lies Moses lake, a splendid body of water which is quite likely to be utilized in watering a large tract in the near vicinity.



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (c) READY FOR IRRIGATION.

RESULTS FROM IRRIGATION.

At present a few settlers have installed pumping plants on Moses lake, and are meeting with success in thus watering their lands. The Moses Garrison ranch is an example of the possibilities in this particular. Mr. Garrison is irrigating 110 acres of orchard and 20 acres of wheat, using a 12-horse-power Fairbanks-Morse engine and a centrifugal pump. His pump and engine installed cost about \$1,000.00. His well, which is 50 feet in depth, cost \$4.00 per foot to dig, or \$200.00 in all. His entire expense for securing water is less than \$10.00 per acre, and his annual expense for fuel does not exceed \$3.00 per acre.

The results to be obtained from irrigation have been well demonstrated in several other sections of the county. Near Ephrata, the county seat, are several tracts which have brought splendid results to their owners. Part of the lands are watered from nearby springs, while other tracts are dependent upon wells. This latter method is gaining in favor, inasmuch as there are indications of an underlying sheet of water through this section giving promise of an inexhaustible supply. It is of record that powerful pumps working day and night have been unable to lower the stand of water in wells sunk in this district. Several orchards in the vicinity of Ephrata have established the adaptability of the country to fruitgrowing.

STRATFORD IRRIGATED TRACTS.

Lying south of Soap lake and extending from the village of Adrian along the line of the Great Northern railway toward Ephrata are the holdings of the Stratford Irrigation Company. This company is irrigating several thousand acres of land, taking water from Brook lake, at Stratford, into and through which Crab creek flows. A large portion of their lands have been sold, and the tracts are now being developed by individual owners. Approximately 200 acres were set out in trees last year. Alfalfa is perhaps the leading crop at present.

A few miles east of the above section, in the vicinity of Wilson Creek and Krupp, there are a number of irrigated tracts planted to young orchards and alfalfa. Land values range from \$100 to \$300 per acre for irrigated tracts.

This entire district has the advantage of ready access to the main line of a transcontinental railway, although up to the present time there has been a local market for all the products raised.

In its virginal aspect the country is bleak and forbidding, impressing the observer as a desert waste. Moreover, being an open country, severe windstorms, with accompanying clouds of dust, are common in the summer. These are conditions, however, which have been met and overcome in nearly all irrigated districts. The pioneers who face the temporary discomforts and privations will see this district within a few years take on an entirely different appearance.



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (d) THE FIRST IRRIGATION.

DOUGLAS COUNTY.

Douglas county lies eastward of the Columbia river, comprising a portion of what is known as the "Big Bend" country. It is reached by the Great Northern railway main line, as also by a branch of the same system, extending from a junction near the Columbia river, into the wheat fields of the northern part.

The irrigable lands of the county lie chiefly along the Columbia river, where a considerable section of the country is rapidly settling up. Also in the Moses Coulee section much development has taken place and additional lands are rapidly being brought under ditch.

COLUMBIA RIVER LANDS.

The lands lying along the Columbia river are mostly tributary to the city of Wenatchee, and the high line canal which supplies much of the Wenatchee valley serves also the Douglas county lands in this section. The waters from the ditch are carried across the Columbia river in two large iron-bound wooden conduits, strung along the bridge which spans the river at Wenatchee. The water is carried at heavy pressure to a ditch constructed along the base of the nearby hills. This ditch, which is in effect a continuation of the Wenatchee high line system, extends up and down the river approximately twenty miles in Douglas county. Tributary to the water supply thus provided there are about 9,000 acres of irrigable lands, much of which is already improved and taking water from the ditch.

The land is sandy for the most part, with a clayish tendency shown at intervals. A strata of gravel is usually found several feet below the surface, affording splendid drainage. Surface rocks are scattered about on much of the raw lands, but they are easily removed, the custom being to pile them along the fences. Ultimately these stores of basaltic and granite rocks will be crushed and used in the construction of a modern highway along the river, to take the place of what is now an indifferent county road.

There are considerable tracts of unimproved lands lying adjacent to the ditch, but as yet not watered by it. Such land is held at prices averaging about \$400.00 per acre.

PUMPING PLANTS.

Beyond the reach of the ditch there are several improved ranches, occupying the open spots along the river, where the steep bluffs recede somewhat from the bank. Some of the ranchers in this section are watering their lands by means of pumps, operated by gasoline. Others have access to live springs in the hills or have built small reservoirs in the gulches for storing the flood waters of spring. Still others resort to current wheels, by means of which a limited amount of water may be lifted and distributed to their lands.



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (c) FUTURE DIVIDEND PAYERS.

Private pumping plants seem to be gaining in favor, and conditions for their successful operation appear to be peculiarly suitable in this section. One such plant, now in use for watering 100 acres of land, cost for installation \$2,500.00, and the expense of operation, outside of the personal care required, is \$1.50 per day. In addition to watering their own lands, the owners supply several neighbors, and the revenue thus derived materially reduces the expense burden. The chief advantage of such a plant lies in the fact that the rancher exercises a direct control over his water supply and has no fear of loss entailed by breaks in supply canals, washouts of reservoirs, etc.

This district is rapidly settling up, and thrifty young orchards are met with on every hand where water is available. The accessibility of Wenatchee as a shipping point and source of supplies is an important consideration.

MOSES COULEE.

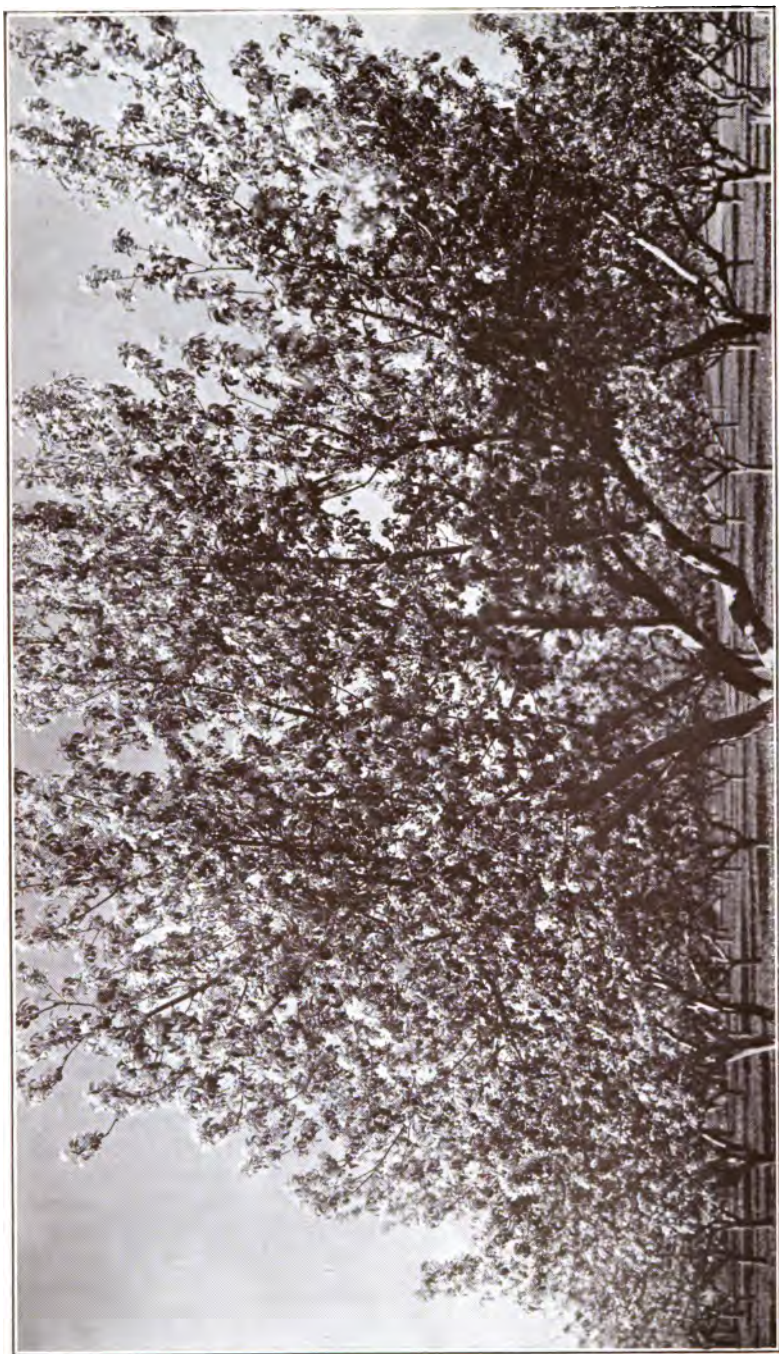
The Moses Coulee district is located about in the center of the county, along the line of the Great Northern branch road which has its terminus at Mansfield.

The lands irrigated constitute the floor of a vast depression or hollow, characteristic of the region, and known as Moses Coulee. Precipitous walls are on either side to a height of several hundred feet, sloping thence upward more gradually until they merge into the rolling lands of the surrounding wheat belt. The soil is a sedimentary deposit mixed with the prevailing volcanic ash and decayed vegetation. It is of great depth and fertility and is said to be free from alkaline solutions.

The Moses Coulee Fruit Land Company has developed 1,200 acres of land here, and contemplates by the construction of reservoirs the reclamation of an additional 2,000 acres. The company follows the plan of planting its tracts to trees, and contracts with purchasers to care for them until the bearing period is reached.

Peaches and apples are both leading products, the extreme warmth of the summer insuring early fruition to the former and high coloring to both. The natural heat is intensified by the huge cliffs or palisades which, as already noted, tower on both sides of the coulee.

The lands available for irrigation purposes here are limited in extent, owing to the peculiar configuration of the country, and will probably all be occupied within a few years.



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (7) TREES IN BLOSSOM.

THE YAKIMA VALLEY.

Three counties—Kittitas, Yakima and Benton—are included within the confines of the Yakima valley, and by reason of close geographical relationship and inter-dependence from an irrigation standpoint, the three counties will be considered together under the above heading.

It was in this valley that the possibilities of transforming the arid sections of the state into gardens and orchards of unsurpassed productiveness was early demonstrated. First by individual farmers, then by groups of neighbors, next by strong financiers, and lastly by the federal government with a programme of reclamation work coextensive almost with the remaining irrigable area of the valley, the great work has gone forward without cessation until, in the most literal interpretation of the expression, the desert has been made to "blossom as the rose."

GOVERNMENT RECLAMATION WORK.

The plans of the government reclamation service cover five distinct projects in this valley. The total irrigable area involved is approximately 400,000 acres, and the estimated expense of completing the work is placed at \$25,000,000.00. Inasmuch as the total minimum flow of the Yakima river has already been appropriated for existing irrigation canals, the government is depending upon the construction of huge storage reservoirs, adequate to the requirements of its various projects. A number of lakes, including Lake Kachess, Lake Keecheelus, Bumping lake, Lake Cle Elum, and McAllister Meadows, all located at the headwaters of the Yakima river and its tributaries, will be utilized for this purpose, their present storage capacity being enlarged through the construction of immense retaining dams. These dams, on which construction work has already been begun, will range in height from 40 feet to 160 feet.

The five projects are described as follows: Kittitas project, located in Kittitas county, irrigable area 60,700 acres; Sunnyside project, located in Yakima and Benton counties, irrigable area 90,000 acres; Tieton project, located in Yakima county, irrigable area 35,000 acres; Wapato project, located in Yakima county, irrigable area 120,000 acres; Benton project, located in Benton and Yakima counties, irrigable area 180,000 acres. At the beginning of the present year, approximately 40 per cent. of the Sunnyside project had been completed. The first unit of the Tieton project, comprising about 11,000 acres, was opened in June, 1910, and it is estimated that 75 per cent. of the work has now been completed. Actual work on the remaining projects has not as yet been undertaken.

HIGH LINE BENTON PROJECT.

This proposed project is a continuation of the Kittitas unit of the Yakima project. The survey has been made by an engineer recom-



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (9) FIGHTING THE PESTS.

mended by the United States reclamation service. The engineer reports a project that will cover 200,000 acres by gravity flow and 100,000 acres by pumping from the Columbia river. Power is to be developed by dropping water from the higher to lower levels. The high line Benton project will include the Benton unit of the Yakima project. The survey of the high line has been passed upon by a board of United States reclamation service engineers and pronounced feasible.

The federal government is willing to store and appropriate the necessary water as soon as Congress passes a law making it legally possible for the reclamation service to sell water to a private corporation. The Warren act, which has already passed the senate, makes provision for such disposal. The estimated cost of the project is \$26,000,000, and the funds are now practically assured. The lands covered are the higher bench lands, and are especially adapted to fruit-growing.

GOVERNMENT REGULATIONS.

In view of the fact that the future history of irrigation in the Yakima valley will be closely identified with the operations of the government reclamation service, it is important that some insight should be given into the regulations under which the service is working.

The reclamation fund is created from the sale and disposal of public lands in certain states having large arid tracts within their borders. The money thus derived goes into a special fund, to be used exclusively in the development of irrigation projects. The work is carried on under the federal department of the interior.

Public lands, open to homestead location, as also lands held in private ownership, may be included under a given project. Occupation and settlement of the first named class of lands is accomplished under the provisions of the homestead act. The size of individual claims, however, is usually limited to 40 acres or 80 acres, and the settler is required to return to the government the actual cost per acre involved in the construction of the project under which he has located. Such payments are distributed over a period of ten years, without interest. Owners of private lands are required to reduce their individual holdings to the maximum limit of area fixed by the government. In general the regulations fixed by the government are strictly enforced, it being the policy of the federal authorities to insist upon the lands being occupied by actual owners. In order to qualify for a water-right, the applicant must either actually be upon the land or make his residence in the vicinity.

CLIMATE AND ALTITUDE.

The general characteristics of the districts included within the Yakima valley are largely similar. There is, however, a wide variation in altitude, and the resultant differences in climatic conditions affect the growing period in the several locations. On the Benton project the altitude is about 500 feet. At North Yakima it is 1,067 feet,



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (A) SOME APPLES.

Yakima Valley
Apple & Pear
Industry
1934

and from there a gradual rise ensues until a maximum altitude is reached at about 2,100 feet above sea level. The lower lands are generally considered as being better adapted to hay, grain and vegetables, while the best fruit districts are on the bench lands in the different parts of the valley. The season is noticeably early in the vicinity of the Columbia river, strawberries ripening here several weeks in advance of other sections.

KITTITAS COUNTY.

Prior to the entry of the federal reclamation service into the Yakima valley, private interests, as is noted above, had already undertaken more or less extensive irrigation enterprises. This condition was common to the several counties in the valley, particularly as regards Kittitas and Yakima counties.

In Kittitas county there are at the present time under irrigation between 50,000 and 75,000 acres of land in private ownership. The bulk of these lands is contained within the Kittitas valley, the first large area of arable land lying east of the Cascade mountains. The location of this valley with reference to the Yakima river and its tributaries is such that practically the entire acreage, double that now under ditch, is readily susceptible of irrigation.

The valley is treeless, except for small growths along the streams, and the soil, largely of sedimentary origin and rich in the elements that make for prolific plant growth, responds splendidly to the application of moisture. The annual precipitation averages about 11 inches, and the mean temperature at Ellensburg, the county seat, is 48 degrees Farenheit.

PRODUCTS.

For many years hay has been a leading crop of the county, and the Kittitas product is held as a standard throughout the northwest. Oats hold an important place in the production of cereals. Potatoes yield from 200 to 400 bushels per acre, and other vegetables are equally productive. The adaptability of the soil to the grasses has created a great dairying industry, and herds of sleek cattle attest their nutritive value. While well suited to raising many classes of fruit, the county has developed only slowly along this line, owing largely to the fact that land holdings are usually large and have been devoted mainly to the industries noted above. The tendency now is toward a division of such lands into orchard tracts, and fruitraising is receiving constantly growing attention. The development of the government irrigation project will stimulate the production of fruit, as much of the acreage to be thus reclaimed is counted as first-class fruit lands. The final surveys for this project have been completed and accepted and the date of the beginning of actual construction may be announced at any time.

ADVANTAGES.

There are certain special advantages appertaining to Kittitas county which should be noted. By virtue of its location in the first tier of



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (4) HARVEST TIME.

11329
P. H. R. O. S. S.

counties east of the Cascade mountains, it enjoys easy access to the growing markets on Puget Sound. This is an asset of first importance and one which will increase in value with the demand for agricultural products in the coast cities. Moreover, the Kittitas valley is traversed by the main line of two great railway systems, the Northern Pacific, and Chicago, Milwaukee & Puget Sound adding to the above the factor of competitive rail transportation. The Northern Pacific Railway Company is now constructing a cutoff line from Ritzville to Ellensburg, which will materially reduce the overland running time of that road.

Land in the Kittitas valley is comparatively cheap, notwithstanding the important advantages mentioned above. Opportunities are presented here for newcomers to engage in a wide variety of profitable occupations both of an agricultural and commercial nature.

Ellensburg, the chief town of the valley and county seat of Kittitas county, has a population approaching 6,000 people. It has excellent possibilities for growth with the rapid settlement of the districts of which it is the distributing center.

YAKIMA COUNTY.

In Yakima county there are under irrigation at the present time approximately 150,000 acres of land, including Indian reservation lands. This is equal to about one-third of the total irrigated area of the state, and easily places the county in a pre-eminent position from an irrigation standpoint.

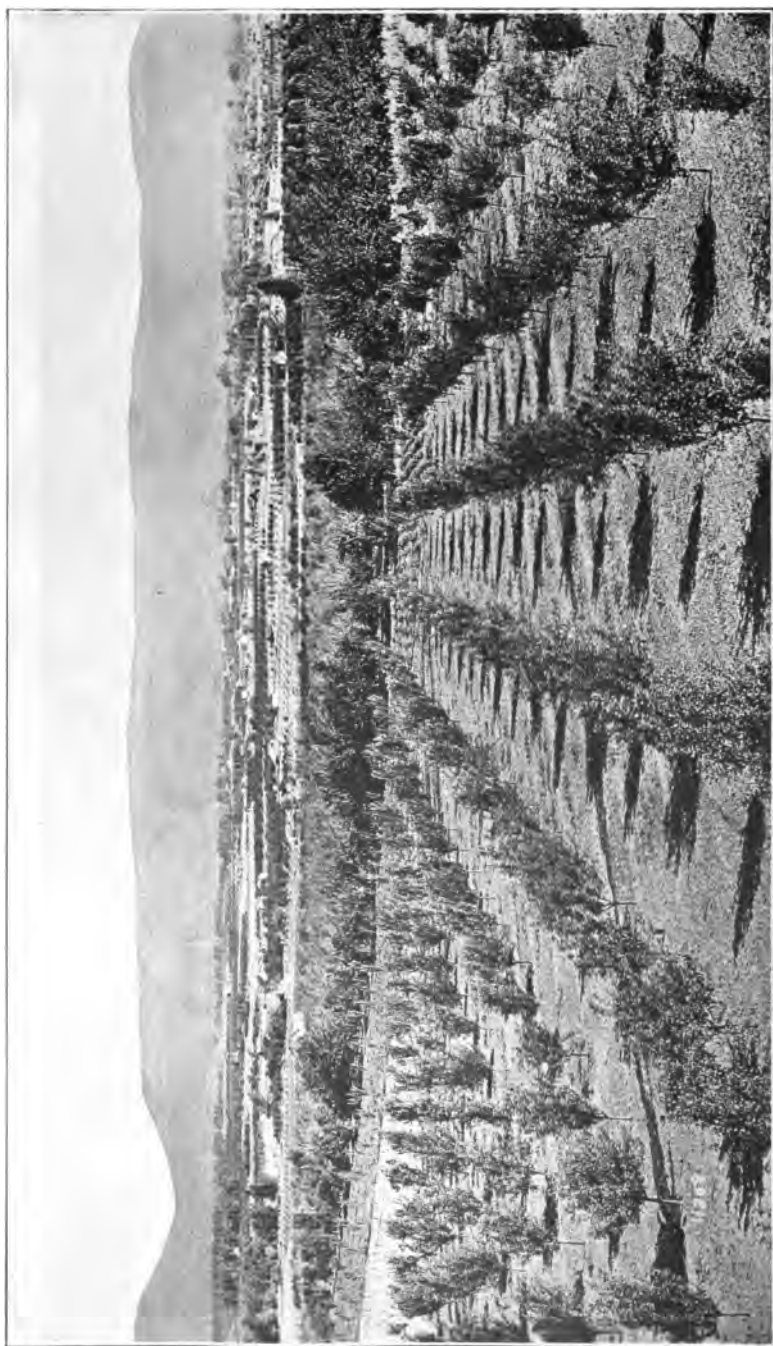
SUNNYSIDE CANAL.

The original entry of the government reclamation service into the state occurred in 1906, when the Sunnyside canal, in Yakima county, was taken over and the development and extension of that system begun.

The main canal is sixty miles in length, and extends from the intake about eight miles below North Yakima down through the valley and well into Benton county. When completed in accordance with government plans, this canal will water 90,000 acres of land, practically the whole of which is held in private ownership. When the government secured the canal, the lands irrigated amounted to about 40,000 acres. During the four years that have elapsed since then the acreage has been greatly increased. A single extension of the Sunnyside canal conveys water to 10,000 acres of land in the vicinity of Mabton, the water being carried to the lands through a syphon constructed under the Yakima river. Other large areas will be reclaimed under this system and the canal will be increased in water-carrying capacity accordingly.

THE TIETON PROJECT.

The lands to be watered under this important government project comprise a district of 35,000 acres lying a few miles westward from the city of North Yakima. Construction work was begun on the main canal



FROM DESERT TO ORCHARD IN THE YAKIMA VALLEY. (J) A PORTION OF THE VALLEY AS IT APPEARS TODAY.

in 1907, and the first unit of the project, 11,000 acres, was opened in June, 1910.

The diversion weir and headgate are located in the upper Tieton canyon, twenty miles above the town of Naches. The main canal itself is twelve miles in length, and is lined with concrete, originally cast in forms eight feet in diameter and four inches in thickness. These forms closely joined constitute in their entirety a continuous and watertight conduit. More than two miles of tunnels were involved in the construction, and the work of driving them was one of the most difficult features of the whole undertaking. The tunnels, of which there are six, vary in length from 100 feet to 3,800 feet. The distribution of the water to the project is accomplished through a network of main and sub-lateral ditches totaling 78 miles in length.

Work on the second unit is in progress and will be completed in part during the present year. The lands under the Tieton project are, in the main, held in private ownership, and ordinarily may be purchased on terms covering a period of several years.

PRIVATE PROJECTS.

In addition to the government projects above mentioned, there are numerous private companies supplying water to lands in Yakima county. The splendid fruit district centering about the city of North Yakima has been developed under private ditches, and, in addition to the waters of the Yakima river proper, many small creeks have been utilized for irrigation purposes. Artesian water has also been found in the Moxee valley, and is successfully used in supplying an extensive acreage.

PRODUCTS AND LANDS.

A summary of the products of the Yakima county irrigated lands includes a wide range, extending from such tender fruits as peaches, apricots and grapes to winter apples of unsurpassed color and flavor. With these are to be included potatoes and all other classes of vegetables, grains, hops, beef-cattle, mutton, wool, dairy and poultry products, honey, and the output of the several fruit and vegetable canneries. An unofficial estimate places the value of the above products in the county at \$8,000 000 annually.

Yakima county, with its immense acreage of lands under ditch and its still larger area of lands that are susceptible of irrigation, offers the widest possible scope for choice to the landseeker. He may make his selection from river bottom, valley or bench land, according to the particular line of farming activity in which he wishes to engage, and he enjoys a further advantage of being able to establish a home at almost any altitude he may elect.

Prices of lands, as elsewhere, hinge upon location, soil, surface contour, condition of water-rights, and more particularly upon the stage of improvement and development.



STACKING HAY IN KITTITAS COUNTY.

TRANSPORTATION.

The main line of the Northern Pacific railway passes through the county and the North Coast system is now building. A branch of the first named road reaches into the Sunnyside district, having its terminal at Grandview. A network of electric lines centering about North Yakima will ultimately bring all the neighboring valleys within the reach of the city. In fact, the transportation problem of the entire county is being worked out on a basis that will bring shipping facilities to every one of its various farming and fruitgrowing districts.

URBAN GROWTH.

Coincident with the development of its irrigated lands, a remarkable growth has been enjoyed by the cities and towns located in the county. North Yakima, the seat of government and metropolis of the county, is a thriving, enterprising community of 14,082 people, enjoying all modern advantages and conveniences. It commands a splendid and growing trade with the surrounding sections, and its business district has been built up on a basis commensurate with its prosperity. Paved streets, a fine court house, substantial school and church edifices, and many handsome residences reflect the spirit of progress everywhere apparent in the city.

Other growing communities in the county are Ahtanum, Cowichee, Naches, Selah, Yakima City, Moxee, Wapato, Toppenish, Parker, Zillah, Granger, Outlook, Sunnyside, Grandview, and Mabton. These towns are trading and distributing centers for the districts immediately surrounding them, and several of them are rapidly developing into substantial communities.

BENTON COUNTY.

Benton county constitutes the lower portion of the Yakima valley, and is bounded on three sides by the Columbia river, into which the Yakima river flows, the point of confluence being near the center of the eastern border of the county.

By reason of its location with reference to these rivers and other available sources of water supply, nearly the whole of Benton county, with the exception of certain of the more rugged sections, is classified as irrigable land.

The districts which already have been brought under irrigation include, in addition to the lands tributary to the government Sunnyside canal, a number of large private projects taking water for their lands either from the Yakima or Columbia rivers.

LANDS AROUND PROSSER.

Prosser, the county seat, is located in the western section of the county, in the center of an important irrigation district, watered by the government Sunnyside canal. All the facts brought out with reference to the Sunnyside lands in Yakima county have equal application



A KITTITAS COUNTY APPLE TREE.

in respect to this district. The products extend all the way from early-maturing berries to winter apples, which have proven exceptionally profitable.

Splendid opportunities are offered here, both on account of the adaptability of the soil and climate to maximum crop production, and by reason of the added fact that lands may still be purchased at exceptionally reasonable prices. A new syphon is now under construction at Prosser, designed to water lands on the south side of the river, which at present are supplied by a large pumping plant. One of the important enterprises undertaken in this district is a 340-acre orchard located near Prosser, owned and in process of development by the officials of the Northern Pacific railway.

A six-acre orchard tract originally developed by E. L. Stewart, of Prosser, is a striking example of the possibilities offered for fruit culture. During 11 years of production, Mr. Stewart received \$25,364.00 from the fruit grown on this tract. This tract was subsequently sold for a consideration of \$10,000.00. The present owners estimate the gross receipts for the current year from the six acres at \$7,000.00.

On the lower lands alfalfa is grown, and runs from six to eight tons to the acre, three cuttings usually being made. Potatoes are a staple crop, producing from 300 to 500 bushels per acre. Corn of excellent quality and heavy yield is raised, but not extensively, owing to the fact that other crops are more profitable.

HANFORD PROJECT.

The lands watered under the above project are located in the north-eastern portion of the county, and comprise a total of 16,000 acres. The immediate plans of the company contemplate the irrigation of an additional area of equal size to the above, while vastly larger tracts in the same locality remain to be reclaimed in future years.

The water is pumped from the Columbia river, power for this purpose being developed at Priest Rapids. The pumping plant has a capacity of 83,000,000 gallons per day. The main canal which delivers the water to the lands is eight feet wide on the bottom, twenty-four feet wide at the top, and attains a total length of nineteen miles.

The soil is a sandy loam with an under strata of gravel, and produces abundant crops of fruits, vegetables and alfalfa. Prices of lands range from \$150.00 to \$300.00 per acre, terms covering a period of five years being given if desired.

KENNEWICK DISTRICT.

One of the leading irrigated districts in Benton county is that which centers about the growing little city of Kennewick. The lands here are watered under the project developed by the Northern Pacific Irrigation Company. The Yakima river is the source of water supply, and forty miles of canals have been constructed, capable of irrigating 20,000 acres of land.



A YAKIMA COUNTY VINEYARD.

This district, including lands lying farther south along the Columbia river and a number of islands in that stream, has long been famous for its early-ripening strawberries, which are marketed as early as April. Peaches, apricots, grapes and melons are extensively produced, and, in fact, for the growth of the more tender fruits this section is unexcelled.

The canal of the Northern Pacific Irrigation Company also irrigates a portion of the Yakima valley surrounding the town of Kiona, situated seventeen miles east of Prosser, on the Northern Pacific railroad. A private project in this section will also irrigate land tributary to Benton City, a new town recently started about a mile west of Kiona. The Richland District, above Kennewick, is also partly irrigated by the Northern Pacific Irrigation Company, as well as by a private project.

Benton county as a whole is well provided with transportation facilities, and is rapidly developing under the stimulus of the irrigation enterprises above described, and others which are reclaiming lands in different portions of the county.

WALLA WALLA COUNTY.

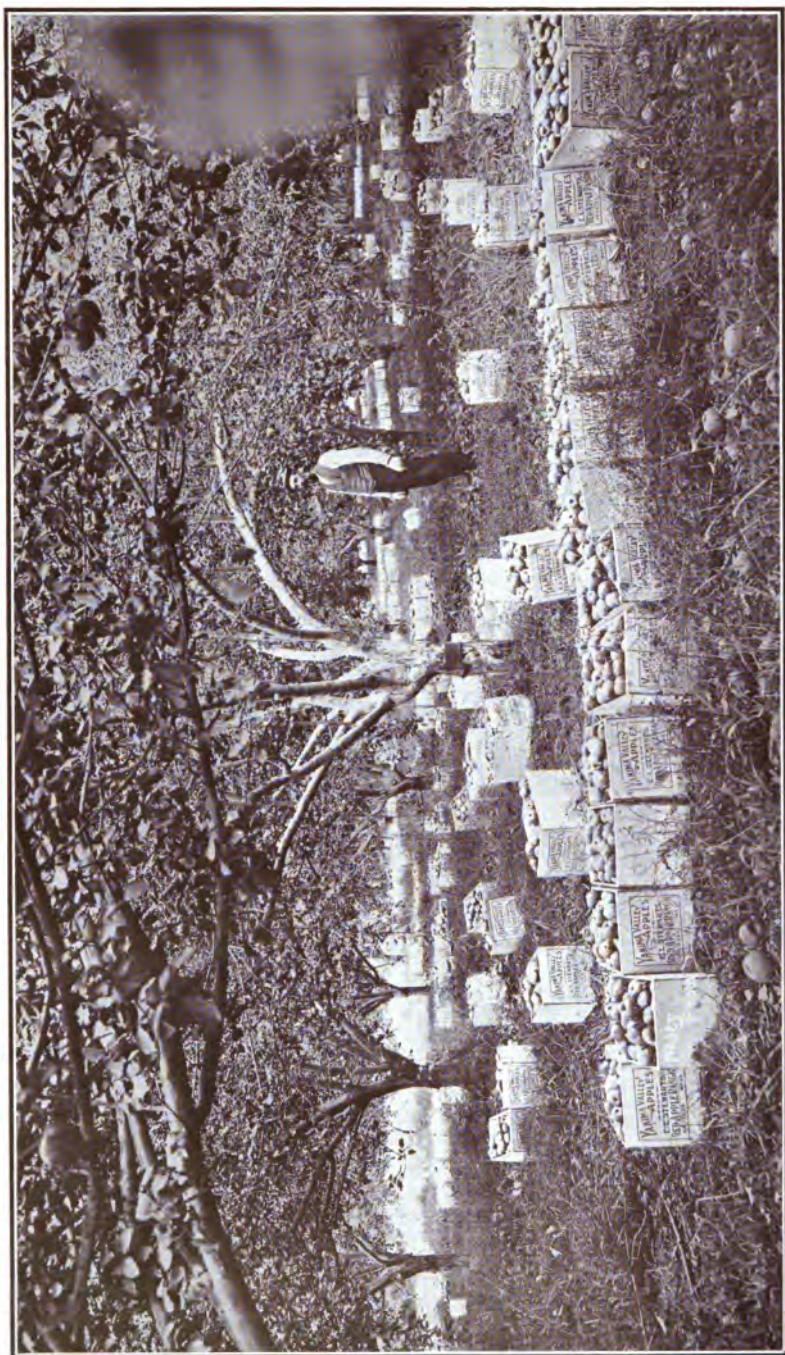
Walla Walla county is located in the southeastern section of the state, its southern border forming a portion of the boundary line between Washington and Oregon. Walla Walla city, with a population of 20,000 people, one of the wealthiest and most enterprising of the smaller cities of the state, is the county seat and the commercial and distributing center for a large district.

Including a number of large irrigation projects and the smaller holdings of a great number of individual owners who water their lands from sources immediately available, it is estimated that there are more than 50,000 acres of land now irrigated or in process of being reclaimed in the county.

BLALOCK ORCHARD TRACTS.

One of the most interesting irrigation enterprises in the state is the project known as the Blalock Orchard Tracts, comprising 1,500 acres of land adjoining the city of Walla Walla. The water is supplied from artesian wells, of which there are twelve on the tract. One of these wells, eight inches in diameter, is 585 feet in depth and has a pressure of 62 pounds to the square inch. When the opening of the well is reduced to one and one-half inches, the water is thrown to a height 112 feet above the surface. The flow from this well is 2,224 gallons per minute. The average flow from each of the 12 wells, when all are in operation, is about 1,200 gallons per minute.

By reason of close proximity to the city of Walla Walla, these lands are being laid out in suburban orchard and garden tracts, ranging in size from two to ten acres. Each well is designed to provide water for



THE STEWART ORCHARD IN BENTON COUNTY.

125 acres of land, and purchasers, in addition to their land deed, are given a *pro rata* right in the artesian well and pipe line system. Streets are being graded through these tracts and a system of domestic water supply installed. An electric railway provides transportation to the city.

During the season of 1910, 60,000 apple trees were planted on these tracts, comprising the following varieties: Rome Beauty, Winesaps, Jonathans, Yellow Newtown Pippins, and Delicious. Prices of land in this district range from \$500.00 to \$800.00 per acre, depending upon the location and state of improvement.

BURBANK PROJECT.

Near the point of confluence of the Columbia and Snake rivers, in the extreme western section of the county, lands to the extent of 13,500 acres are being developed by the Burbank Power & Water Company. The tract is made up of sagebrush bench lands, lying at an elevation of 75 feet above the rivers. The soil is of good depth and of the character common to the Columbia river basin.

The water is obtained from the Snake river, a water power being developed for this purpose. At this point a fall in the river of eleven feet in one mile has been utilized for power purposes, including power canal one and one-half miles long, 50 feet in width on the bottom and about 30 feet deep. The machinery consists of two units, each composed of one twin horizontal turbine, direct-connected to one cyclodial rotary pump, operating under two lifts of 55 and 85 feet respectively. The capacity of the pumping plant is 113 cubic feet per second.

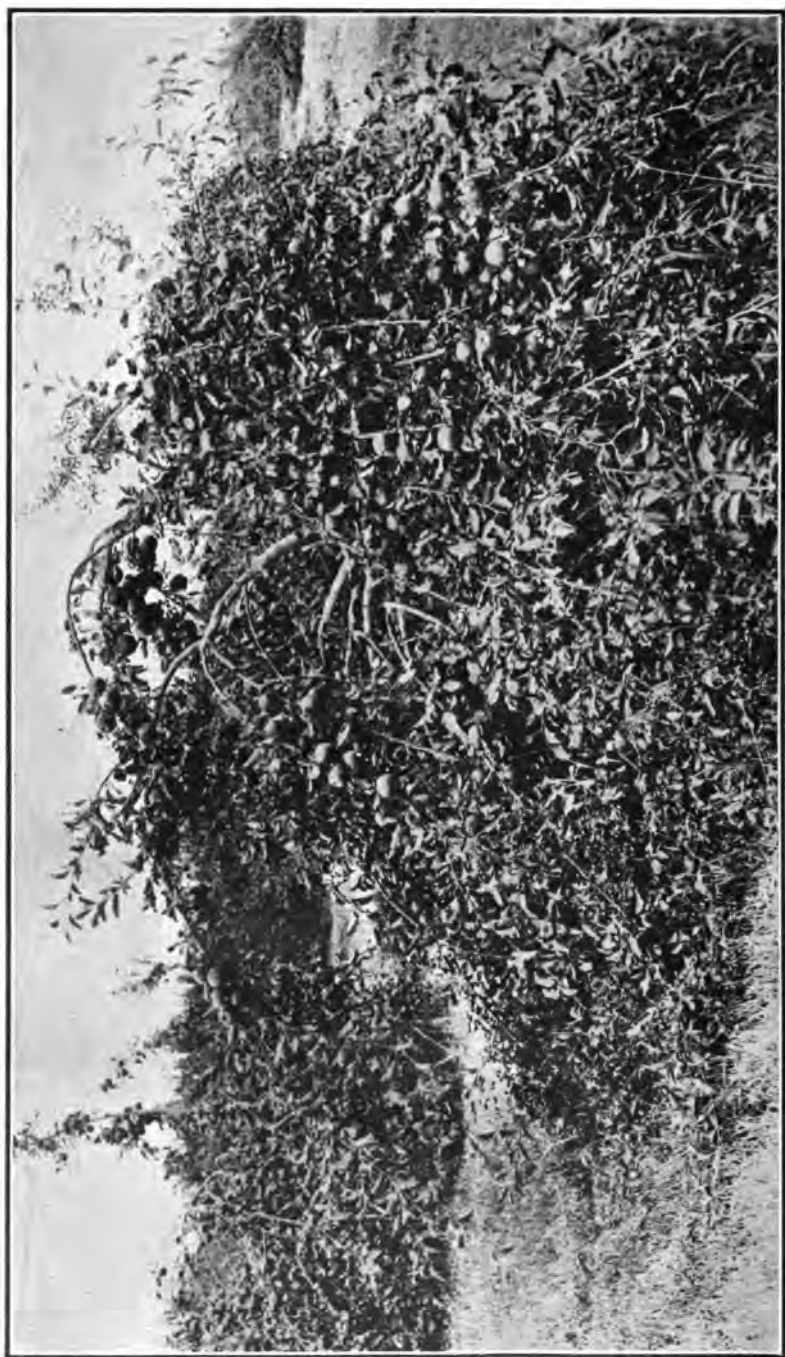
Transportation facilities are furnished by the Northern Pacific and O. R. & N. systems, which pass through the project, while no portion of the lands is more than two miles from a railroad station. In addition, steamboat navigation on the Columbia and Snake rivers is successful during the greater portion of the year. About 500 acres of this land is now under cultivation.

Water rights provide for 32 inches of water during the season, beginning April 1st and terminating November 1st. Land values range from \$200.00 to \$300.00 per acre, with an annual maintenance fee of \$3.50 per acre.

GARDENA.

Fifteen miles southwest of the city of Walla Walla, a tract of 7,000 acres, known as the Gardena Contoured Tracts, is being developed by the Walla Walla Irrigation Company. The land lies 150 feet above the valley of the Walla Walla river, from which stream the water for irrigation purposes is obtained. An open ditch twenty miles in length carries the water to the tract, while an additional supply, sufficient to irrigate 2,000 acres, is obtained from the surplusage of the water system which serves the city of Walla Walla. A concrete conduit delivers this latter supply to the main irrigation canal.

The size of the different sub-divisions in the tract is governed by the contour lines, on the theory that irrigation is thus facilitated and



FIVE-YEAR-OLD JONATHAN TREES IN THE ORCHARD OF ELMER JOHNSON, BENTON COUNTY. FALL OF 1910.

the amount of unutilized land reduced to a minimum, streets and sub-ditches for carrying off the surplus water being placed on the lower levels.

Three thousand acres of land are now under cultivation, most of which is planted to Winesap apples. Alfalfa is a staple crop here, four cuttings frequently being made annually. During the season of 1909, products to the amount of 600 carloads were shipped from this district over the O. R. & N. Company's lines. The North Coast system will reach Gardena, and surveys for an electric line to Walla Walla have been made.

In addition to the foregoing, several other important projects are being developed in the county, notably near Attalia, where several thousand acres have already been reclaimed.

ASOTIN COUNTY.

Asotin county occupies the extreme southeastern corner of the state, its eastern and southern borders coinciding with the Idaho and Oregon boundary lines respectively.

THE CLARKSTON DISTRICT.

There are some ten thousand acres of irrigated lands in this county, of which eight thousand acres, comprising what is known as the Clarkston irrigation project, lie adjacent to the towns of Clarkston and Asotin, the latter being the county seat.

The irrigation system for supplying the land is constructed on the most substantial and approved lines. The headworks and dams on Asotin creek, from which the water is derived, are of concrete, and the water is delivered to the project through a steel-bound stave conduit forty-eight inches in diameter. Thence it is distributed to the individual tracts through pipes of smaller dimension.

SOIL AND CLIMATE.

The soil here is a fine loam of good depth, with some sand and gravel in places. Regarding the climate, Prof. O. L. Waller reports as follows:

"The mean annual temperature is 53.2° F.; the average for January 35.9°; the average for July 73.6°; the average latest killing frost in spring is April 9; the average date of earliest killing frost in fall is November 4. Any damage by late spring frosts is minimized by smudging. The average annual rainfall for the past seven years has been 13.83 inches, most of which came from November to April."

Cherries and peaches were leading products until within the last few years, during which time apple orchards have been extensively planted, the chief varieties being the Spitzenberg, Newtown Pippin, Winesap, and Jonathan. Grapes also are grown quite extensively.



FIVE-YEAR-OLD APPLE TREE GROWN IN SPOKANE COUNTY.

CLOVERLAND.

About 12 miles west from the town of Asotin is the district known as Cloverland. Irrigation was first undertaken here some eight years ago, when a portion of the waters of George creek, a stream having its source in the Blue mountains, was diverted and brought to Cloverland by means of flumes, trestles and ditches, totaling some eight miles in length.

The lands are located on a plateau about 2,500 feet above sea level, having a general slope toward Snake river and Asotin creek. The soil is of a loam character, having a high percentage of mineral elements. Much of the land is planted to orchards, including cherries, plums, prunes and pears.

TRANSPORTATION.

Transportation for Asotin county is provided by the Northern Pacific and O. R. & N. railway companies, and also by navigation on the Snake and Columbia rivers. With the completion of the Dalles-Celilo canal within two or three years by the U. S. government, the county will have through navigation to the Pacific ocean for steamboats of three hundred to four hundred tons.

OTHER EASTERN WASHINGTON LANDS.

LANDS AROUND PASCO.

In the vicinity of Pasco, the county seat of Franklin county, the Pasco Reclamation Company is developing a project comprising a total of 10,000 acres. The water is taken from the Snake river by electrically operated turbine pumps and is delivered to the project through a pipe line twenty inches in length and from thirty-two to thirty-six inches in diameter. Only two miles of open ditch are used in the system.

During the season of 1910, water sufficient to cover 5,000 acres was delivered to the project.

The soil here is a sandy loam, and is highly praised by government experts for its depth and high plant food content.

The lands are of a gently rolling character, sloping toward the Columbia river. The climate gives a growing period of unusual length, strawberries and vegetables maturing several weeks in advance of other sections.

Land values range from \$200.00 to \$350.00 per acre, payments being arranged to extend over a period of several years. Transportation facilities are excellent, the district being reached by the main line of the Northern Pacific and the Spokane, Portland & Seattle railways. A branch of the first named system extends into Walla Walla county.



AN IRRIGATED PEACH ORCHARD IN THE SPOKANE VALLEY.

TOUCHET VALLEY.

In the valley of the Touchet river, in Columbia county, lands originally embraced in wheat farms are now being brought under irrigation and planted to orchards, or utilized for various branches of intensive farming.

The possibilities of this section were first demonstrated by Mr. J. L. Dumas, who developed a tract of 100 acres located four miles below the town of Dayton. The net profits from the operation of this tract during a period of three years amounted to \$56,000.00. There is an abundance of water in this valley for irrigation purposes, and additional lands are rapidly being placed under ditch. The total irrigated area of the county at present is placed at 1,000 acres.

LANDS IN LINCOLN COUNTY.

In the northern part of Lincoln county, occupying advantageous locations bordering on the Columbia river, irrigated farms are found at frequent intervals. Near the little village of Peach, several hundred acres of land have been reclaimed and plans for enlarging the area irrigated are maturing. When this section is supplied with adequate transportation facilities, it will develop rapidly.

SNAKE RIVER LANDS.

Along the Snake river, bordering on Whitman county, are numerous tracts of sandy bottom lands which are irrigated largely by means of pumping plants. These tracts are usually the holdings of individual farmers, and produce fine yields of early vegetables and fruits.

IRRIGATION IN WESTERN WASHINGTON.

Climatic conditions in western Washington are such that as yet very little attention has been paid to the possibility or desirability of farming under irrigation. In nearly all parts of this section of the state there is a heavy rain precipitation, sufficient for the maturing of all crops. There are some portions of western Washington, however, which by reason of advantageous location and a somewhat slight rainfall are well suited to development under systems of artificial water supply.

In a section of Clallam county, which county faces the Pacific ocean on the west and the Straits of Juan de Fuca on the north, conditions have been found particularly favorable, and a total of five thousand acres has been brought under irrigation ditches. The lands thus watered are located on and near the Dungeness river and are within four or five miles of salt water. The village of Sequim is the trading point of the district, which is commonly spoken of as Sequim prairie.



THREE-YEAR-OLD ORCHARD, NEAR PASCO, FRANKLIN COUNTY.

The town of Dungeness and the boat landing at Port Williams are only a few miles away.

These prairie lands, set down in the midst of a great timbered section, were for many years undeveloped, owing to the light rainfall, which averages about twenty inches annually. This condition is explained by the proximity of the Olympic mountains, which range attracts and holds in the form of snow the bulk of the moisture carried by the winds from the Pacific ocean.

SOIL AND PRODUCTS.

The soil is made up of silt deposits, with some gravel, is of good depth, and improves rapidly under tilling. The irrigated lands produce splendid crops of clover and timothy, while alfalfa to a limited extent has been successfully raised. Records of seven tons of timothy hay to the acre have been reported. Wheat, oats, potatoes and onions are also leading crops. Yields of potatoes reaching 400 bushels to the acre are common, while oats run often as high as 110 bushels or more. Small fruits are raised in abundance, including strawberries, raspberries, blackberries, loganberries, gooseberries, currants, etc., while several bearing orchards attest the adaptability of the district to the production of tree fruits.

At present the chief industry is dairying, and the lands are given over principally to hay and grain or are used for pastures. Poultry-raising as an adjunct to dairying is also commanding increasing attention. A ready market is available for both dairy and poultry products, local creameries and produce dealers absorbing the total output.

IRRIGATION PROJECTS.

There are three irrigation projects in operation, known as the Sequim, Eureka and Independent ditches. All three were constructed through coöperative efforts on the part of the landowners interested. No difficult engineer problems were encountered, and, as the lands are comparatively close to the source of water supply, the cost of construction per acre was exceptionally light. The annual maintenance fee rarely exceeds fifty cents per acre. A water-right has been taken out for a fourth project, upon which it is stated construction work will soon be under way. Practically all the prairie lands have already been brought under irrigation, but there still remains a considerable area of logged-off timber lands which, when cleared, are equally good for agricultural purposes. These lands will be developed as conditions warrant.

TRANSPORTATION.

This section has no rail transportation, but steamers calling regularly at Port Williams and Dungeness furnish ready means of communication with Seattle and other Puget Sound ports. An excellent system of roads enables the farmers to reach the various shipping points of the county with ease and comfort.



IRRIGATION CANAL AT GARDENA, WALLA WALLA COUNTY.

PIERCE COUNTY.

South of the city of Tacoma, in Pierce county, there is an extensive prairie section similar in some respects to the Clallam county lands above described. There are thousands of acres of these lands entirely open in places, and elsewhere covered with a scant growth of scrub oak and other small timber.

Until very recently this section has been considered practically valueless for agricultural purposes. The soil is gravelly and of a depth ranging from 10 inches to two feet. In summer time the country presents a parched, arid appearance. Within the last two years, however, it has been shown that under irrigation and proper cultivation profitable crops of many kinds can be produced. Thus far no project has been carried out for irrigating these lands on an extensive scale, although a plan for developing a gravity system from the Nisqually river is being considered. A few individual owners are watering their holdings from wells, and it is through their efforts chiefly that the possibilities of the section have been demonstrated.

A short distance from Cosgrove station, on the Northern Pacific Railroad, an irrigation farmer of long experience in the Yakima valley, Mr. C. L. Fisher, is developing a tract of twenty acres. Water is obtained from a well 39 feet in depth and is raised to the surface by a six-horse-power gasoline engine and pump. The cost of fuel for operating the pump is 6 cents per hour. The water is conveyed to the lands in wooden flumes, from which it is distributed through furrows averaging about 300 feet in length.

Two irrigations to the season are considered sufficient for potatoes, and the pump running steadily for three days lifts sufficient water to irrigate four acres of land. Fruit trees are irrigated three times during the season.

The principal crops raised by Mr. Fisher for 1910 include potatoes, of which 12 acres were planted; sugar beets, one-half acre; small fruits, one and one-half acres, and garden truck of different varieties grown on a considerable area. There are four hundred fruit trees on the tract.

The potatoes yielded between five and six tons to the acre, and other vegetables gave equally satisfactory results. Blackberry vines set out in April, 1910, exhibited a growth of ten feet when examined in October.

The fruit trees are thrifty, showing a new growth during the season of three feet. From the results already obtained it is anticipated that fruit-growing as a commercial enterprise will soon be developed in this district, cherries and pears appearing the best adapted to meet all the conditions.

The proximity of these lands to the city of Tacoma as a marketing center and the added fact that transportation both by steam and electric railway is already established are considerations of first importance in estimating the advantages offered.

In Thurston county there are several thousand acres of similar lands which present equally attractive opportunities for irrigation.



ONE OF TWELVE GUSHERS ON THE BLALOCK ORCHARD TRACTS,
WALLA WALLA COUNTY.

EARNING A LIVING BEFORE ORCHARDS COME INTO BEARING.

The problem suggested in the above title gives the average home-seeker in the irrigated districts much concern, and more especially if the bulk of his funds has been expended in the purchase of his land. If he settles on an undeveloped tract with the intention of planting an orchard, a period of several years must elapse before his trees will bring him a revenue, and in the meantime he must make a living as best he may. How this difficulty has been met and overcome by a great many individuals is set forth in the following reports of their respective experiences:

JOS. W. LIPE, Clarkston: My place (one acre) was planted when I purchased it. I made a good living by raising garden truck between the trees until they came into bearing, and continue to do so, as I had to replace many of the trees on account of inferiority of the fruit. Part of the acre is in chicken yards, and gives profitable returns. Every inch is in use, and I want to say that it takes time, work and patience to make it a success. I am perfectly happy and would not live anywhere but on my "one-acre farm."

H. C. LARSON, Clarkston: A man can make a living before trees come into bearing if he takes hold of it in the right way. Part of his tract should be planted in early garden, and between the trees he can raise dewberries and strawberries. This year's strawberries (one acre) netted me \$157.00. Last year's dewberries (one acre) netted \$111.00. Besides the above, we raise beans, peas and tomatoes, which bring a good price. The main thing is to get the right varieties of trees and small fruit. A man who is willing to work can make a good living, and a little beside, in this section while his trees are coming into bearing.

PETER SPOHN, Clarkston: I would advise to plant vegetables, if not too large a tract; also melons, if not too far from railroad to ship. If too far to ship, would plant clover, alfalfa, corn and peas, and raise hogs. Would leave space of four feet between rows of trees and crops to give room for good clean cultivation, and as trees get older and require more room would plow under clover and other crops as fertilizer for the orchard.

H. W. DESGRANGES, Kennewick: Where settlers go upon the land, a splendid living may be made out of chickens the first year, and by planting strawberries between the tree rows, enough can be realized from them to pay for the land by the time the orchard comes into bearing. Land is sold on easy payments, but the beginner must have sufficient means to bear the expense of improving the land and planting it to trees and berries. This requires a capital of from \$50 to \$75 per acre, and this should serve as a scale to measure the number of acres one is to handle. The above amount he should have in his pocket after he has made the first payment on the land. It does not require a fortune to start in on irrigated land, as some seem to think, but it does require some money, and with a little capital success is certain.



AN ENGLISH WALNUT TREE AT CLARKSTON, ASOTIN COUNTY.

G. L. FINLEY, Kiona: The newcomer must either have funds sufficient to meet his living expenses for two years or he will have to work for wages, which can always be obtained at \$2.50 and upwards per day. The third year he should have sufficient income from his berries and garden truck to keep him going until his trees come into bearing. Strawberry growing is one of the best paying industries. On the right kind of soil \$400.00 is about the average return. Potatoes are also a profitable crop, as we have an excellent home market and the price is never less than \$15.00 per ton. Two years ago I got \$40.00 per ton for mine that I held over until spring. The most essential thing for success here is "sand."

OMAR W. RICH, Kennewick: Strawberries, asparagus, alfalfa and garden truck are grown between the trees to help pay the living expenses. A few cows, chickens and bees are good if intelligently managed. The cows are the surest paying of anything, as we grow ten tons of alfalfa to the acre, have mild winters, and milk and butter are always in great demand at good prices. The alfalfa is also a great benefit to the land as a fertilizer. My crop this year is as follows:

Strawberries, Clark Seedlings, 100 crates sold for....	\$250 00
Bing and Royal Anne cherries, 100 crates sold for....	200 00
Elberta peaches, estimated 500 boxes.....	250 00
Bartlett pears, estimated 200 boxes.....	300 00
Tokay grapes, estimated 600 boxes.....	300 00
Apricots, apples, prunes, other berries, estimated.....	100 00
Potatoes, garden, alfalfa, estimated.....	100 00
Total.....	\$1,500 00
Size of tract, five acres.	

W. M. SCOTT, Kiona: If the soil is suitable for potatoes, few better crops can be grown between the young trees. Not all the soil here, however, is adapted to potatoes or will produce them successfully. In such cases, strawberries are as good as anything, and are nearly always quite profitable. It is, however, considered by many experienced horticulturists that an orchard is better off if nothing is grown in it but the trees, unless it is some legume crop that can be plowed under at least part of the time to enrich the soil. In following out this plan, it would be a good plan to keep a few good dairy cows. They will bring in ready money all the time and will greatly aid in building up and maintaining the fertility of the soil. In my own case, I engaged in dairying for some years and found it both profitable and congenial until failing health compelled me to give it up.

T. B. KENDALL, Kiona: We have eight acres under ditch, all in alfalfa and fruit. One year, from three-fourths of an acre of strawberries planted between peach trees we picked 175 crates of berries, which sold in Seattle at \$4.50 and \$5.00 per crate. The following year the frost injured the berries, and we got only 75 crates. Then I set out another three-quarter acre tract in berries, and this year got 243 crates. I also raise garden truck to sell, and the garden pays all my store bills. I manage to lay by more or less money each year.

S. E. MARICAL, Entiat: In regard to making a living on land until trees bear, will say that we grow all kinds of truck between the trees, such as melons, corn, tomatoes—in fact all kinds of vegetables, which find a good and ready market.

GEO. B. SPENCER, Farris: I have lived in this part of the country for sixteen years and have done fairly well. If a man has any get-up to him, he can make a good living by raising strawberries or garden truck until his trees come to bearing. Fruit trees come on quickly here. My trees that were five years' old last year averaged eight or nine boxes to the tree. I took second prize on Winter Bananas at the



CHERRY TREES IN BLOOM, NEAR CLARKSTON, ASOTIN COUNTY.

Spokane apple show last year, and that would indicate this to be a good place in which to raise fruit.

J. L. DUMAS, Touchet Valley (near Dayton): My land (100 acres) was settled in 1856, and was farmed in wheat and other crops continuously until planted in orchard. My chief crop between the trees was potatoes. In the five years that I raised potatoes (1898-1903) prices averaged nearly one dollar per sack, and the yield was from 60 to 100 sacks per acre. Other paying crops were onions, corn and nursery stock, but at least 90 per cent. of the cost of maintaining the orchard came from the potatoes.

S. W. USHER, P. O., Wenatchee: I make my living by improving land for others. Some of my friends grow vegetables, melons or cantaloupes between tree rows. This being a newly developed section, not many have an opportunity to do this, as the first consideration is the trees.

J. W. BROYLES, Pomeroy: In 1909, we had off of about 6½ acres in berries, potatoes and onions a little over \$2,000.00. There was 1¼ acres of strawberries, from which we got 213 crates, and sold at an average of \$2.59 per crate. From about three-fourths of an acre in blackberries and red raspberries we got 140 crates, which brought an average of \$2.25 per crate. Our whole berry crop brought over \$850.00. I would suggest that a man starting in on a new place should plant his orchard tract to potatoes and onions, as there is money in both crops, and the land cannot be put in too good shape for trees.

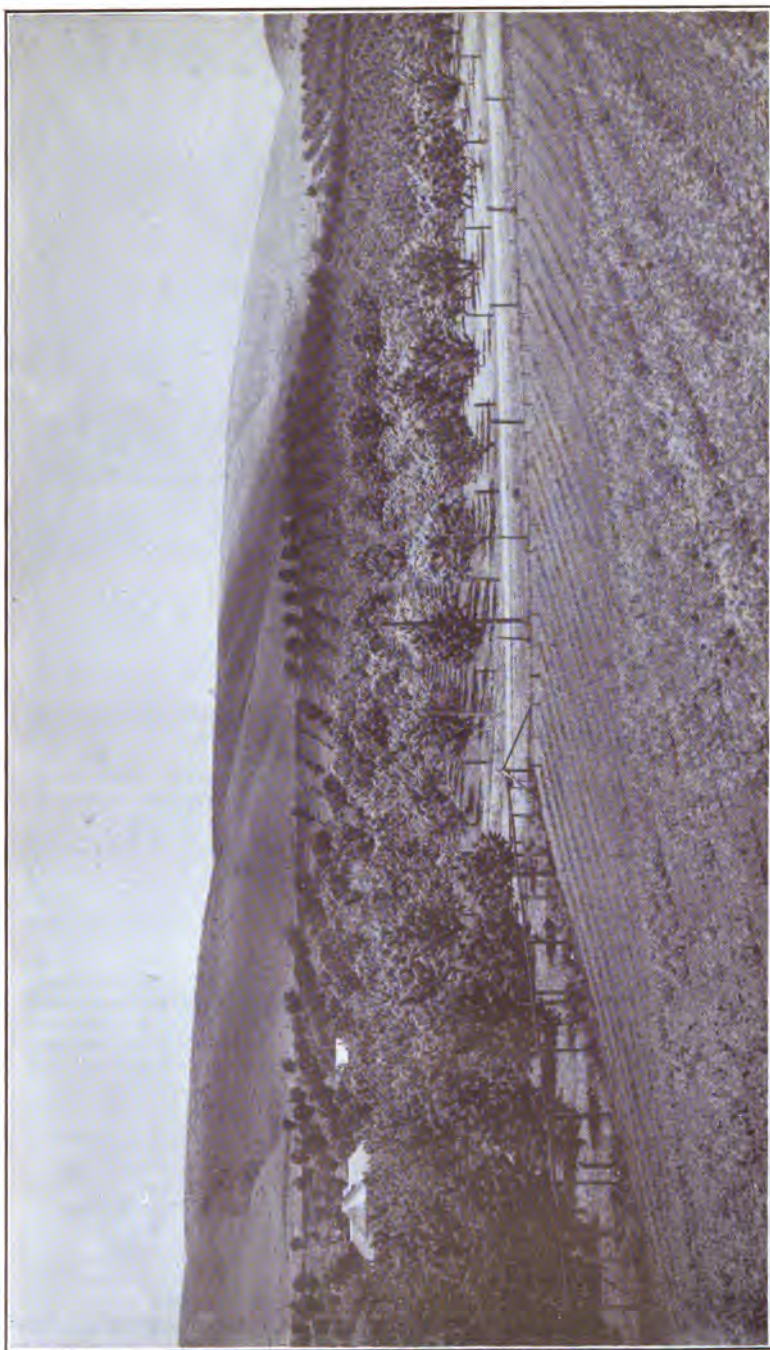
J. D. REARD, Ephrata: I am growing vegetables, such as potatoes, sweet corn, beans, carrots, watermelons, garden peas and other garden truck, at a good profit above all expenses of the orchard. I am irrigating from a well, and pump all the water at an expense of \$4.00 per acre each year. I consider this better than gravity water.

J. P. FLYNN, Ellensburg: A living may be made by raising strawberries, potatoes, onions, etc., between the rows. Potatoes give from 200 to 400 bushels to the acre. A small piece of ground, about 25 feet by 35 feet, produced this season \$36.80 worth of strawberries, besides sufficient to supply a family of five persons. Pears, apples, prunes and blackberries are all fine producers.

FRANK GARBER, Okanogan City: In the irrigated districts which have transportation facilities a living may be made upon land planted to fruit trees before they come into bearing, by growing between the rows of trees such crops as potatoes, cantaloupes, watermelons, tomatoes, corn, etc. Where such crops thrive as they do in the Okanogan section, this can be done without injury to the growing trees. Markets have been rather uncertain here, owing to the lack of transportation, but the railroad now building will solve this problem. Some who plant only small orchards and do not care to crop between trees work for others the greater part of the time and make their living in this way. As the land here when growing young trees and properly tilled requires but two irrigations in a season, all of one's time is not required in caring for a small tract.

B. E. HENDRICK, Omak: A living may be made from land planted in trees, by raising potatoes, onions, beans and all kinds of garden truck. Also strawberries can be grown at a great profit, as they yield very heavily and ripen about May 15th to 20th. They require only a small amount of capital for plants and will bear within one year after planting.

L. B. McLEAN, Brewster: A good living may be made by raising truck between the tree rows. Almost anything will grow here that is cared for. I raised corn, mostly, on my land in 1909; raised plenty on



FRUIT FARM ADJOINING TOWN OF ASOTIN, ASOTIN COUNTY.

seven acres for five head of stock, fattened three hogs, and have corn enough left to fatten three more. On one-half of an acre I raised 85 sacks of potatoes, and other vegetables did well. One can raise any kind of berries in a young orchard. I received as wages, \$1.00 an hour for self and four-horse team, and single hands demand \$2.00 to \$3.00 per day, without board. There is much work to be done.

GEO. F. BLOOD, Spokane Bridge: Have tried crops between trees for three seasons. For the first year averaged \$50.00 per acre from potatoes. The second year was a failure, owing to lack of water supply. Third year, beans on three acres brought \$30 per acre; one acre of early potatoes brought \$80 net; one acre of tomatoes brought \$175 net profit; two acres in blackberries and dewberries, first-year bearing, brought \$50. This year have taken care of twenty acres besides our own and work team outside wherever possible, or put land in shape for trees for other parties. It pays better than crops between trees and saves fertility of soil. Have averaged over \$100 per month, besides caring for my own tract.

M. HANLY, Spokane Bridge: It is not difficult to make a living in this district, the Spokane valley. It was impossible to do the labor and team work here last season; also the work of taking care of tracts for non-residents. All berries do well here, as all vegetables. From this season on there will be plenty of work, spring and fall, thinning and picking apples. If a man has the price of his tract, he can make it; but if he expects to pay for the land from the crops, I would not advise him to buy here or in any other section where raw tracts are high-priced.

A. W. TURNER, Fruitland: In reference to making a living before fruit comes into bearing, gardening pays well. Good money is made in raising strawberries, tomatoes, etc., and, besides, there is generally lots of work in the immediate vicinity, where one can put in an occasional day for cash.

JOHN MELZER, Two Rivers: I am engaged in raising poultry and gardening, and have made a comfortable living. I had no cash when I started and had to work for others, hence could not give all my time to my land. I do not believe there is any reason why a man cannot make a living on irrigated land. Cultivation is the main thing. My potatoes run eight to twenty-seven to the hill without fertilizing. My whole crop has been marketed. There is an abundance of land to be had here, either with or without water.

S. A. FERREL, R. F. D. No. 5, Walla Walla: A living may be made from truck gardening while the trees are small. I find that berries are pretty hard on the soil with young trees, but the trees will grow some, and good money can be made in that way. I find that corn or potatoes between the rows are as good for the young trees as clean cultivation.

JAS. BRAKE, Wallula: In my particular locality you can raise almost everything—potatoes, squash, beans, peas, peanuts, radishes, turnips, etc. I get my supply of water from a well with a gasoline engine and pump. Turkeys are a good side line here. Out of 72 hatched, I have 62 living and thrifty.

HARRY K. SPALDING, Sunnyside: The best small fruits to grow between the young trees are strawberries, raspberries, blackberries, currants and gooseberries. I prefer the strawberries, as they are highly profitable and easily cared for. The strawberry is very beneficial in another way, as it thrives best under good cultivation, which is a benefit to the young trees. Such crops as potatoes, onions and muskmelons and watermelons are also grown in young orchards to good

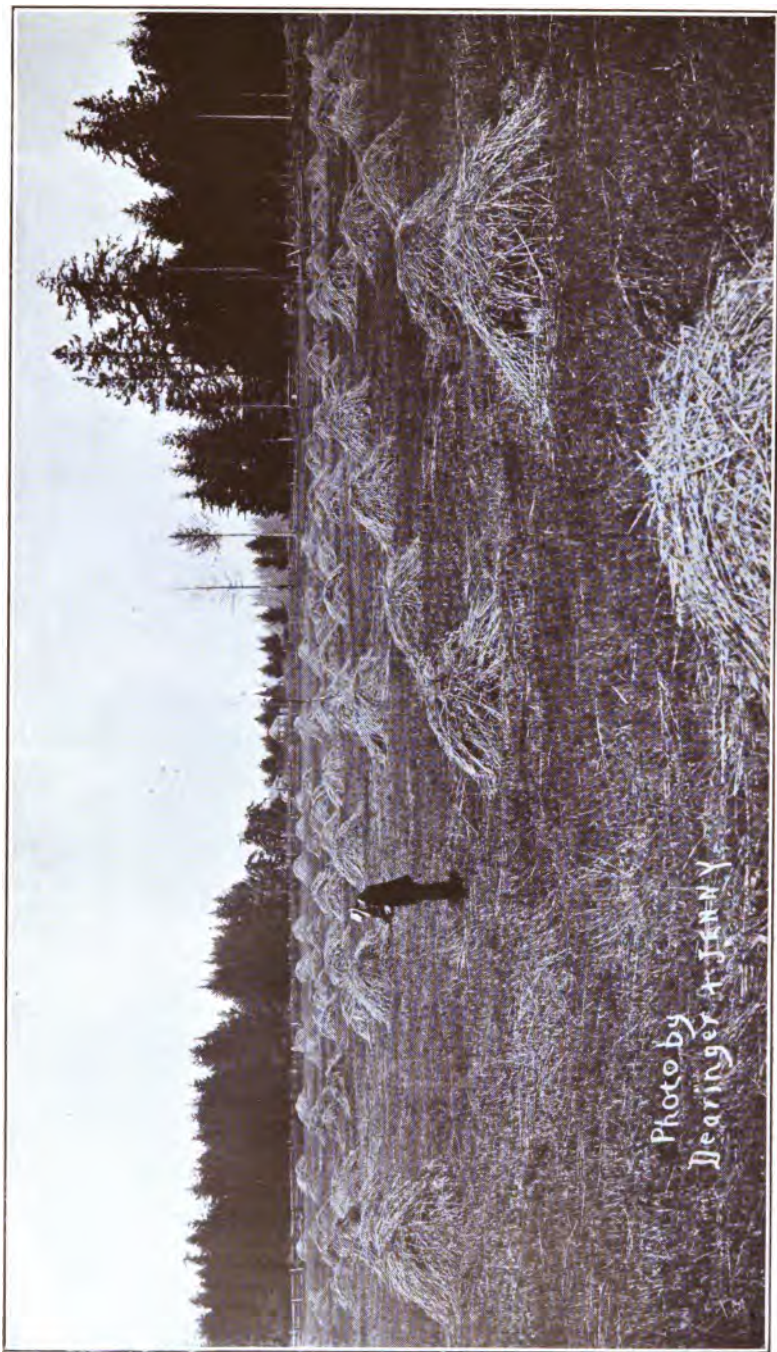


Photo by
Dearing & J. H. H. Y.

OATS RAISED UNDER IRRIGATION, SEQUIM PRAIRIE, CLALLAM COUNTY.

advantage. Some growers have made a success of grapes among young trees for a few years.

WM. H. ABRAMSKY, Selah: Potatoes and truck may be raised on fruit land, but I should advise newcomers to come with enough money to carry them along. In addition to his land, there is the expense of a house, team, barn, cistern, wagon, tools, etc. One should not be carried away by glowing reports of rearing an orchard without work, as it is work from morning to night. Care should be taken in selecting the soil to see that it has depth and good gravel drainage.

ERNEST C. HILL, Selah: I purchased my place (20 acres) in 1908, and have had no experience in raising a young orchard. In this section the ranchers raise potatoes, onions, alfalfa and small fruits until their trees come in bearing. I paid \$650.00 per acre in the month of March, 1908, and now bearing orchards around here are selling at \$1,000.00 per acre. Have only been in this business two years, and last year won third on sweepstakes and second on carload lots at the Spokane Apple show.

GEO. M. CHASE, Grandview: If a man is a good gardener and intends to live on his ranch, he can make money farming between the rows, but if he hires his place taken care of he should confine himself to trees only. I consider alfalfa the surest crop.

HERBERT POWELL, Mabton: A living may be made on fruit lands before the trees come into bearing by raising berries, potatoes, corn or other crops between the tree rows. Alfalfa can also be grown very successfully. My way of planting is to grow berries between the trees and have a part of the land in alfalfa and keep cows and chickens. In this way I build up the land all the time. If the land is managed as it should be, there will be a handsome profit after the first year.

DR. F. C. JONES, Sunnyside: I think that on the level lands one can do as well with root crops or truck as with trees. I would advise those coming to this valley to decide first one of three things. Do you want to raise alfalfa? Then buy an alfalfa ranch. If you want to raise truck, then get level land close to market, and if you wish to raise apples, buy good orchard land. It is difficult to make truck gardening pay on land planted to trees, but one can start in at once with truck and make it pay from the first.

GRANVILLE LOWTHER, North Yakima: The best small fruit crop is strawberries, that will yield one year from the time of planting and will often make \$300.00 per acre. The most profitable crop is tomatoes, if blight can be prevented, and many claim to have overcome this by planting in hills, thus avoiding transplanting, and by watering at night, rather than permitting the water to run when the sun shines. Onions, asparagus, cabbage, beans, peas, carrots, etc., all do well. A good gardener will make a living from five acres. A poor gardener may need ten acres.

PAUL KILLIAN, Mabton: A living may be made by growing strawberries or other small fruits between the rows or by raising vegetables. Strawberries will yield from 100 to 250 crates per acre, and will sell from \$1.00 to \$3.60 per crate. It will cost about 75 cents per crate to have them picked, packed and cost of crate ready to ship. The average price is \$2.00 per crate. Chickens and other poultry pay well. Eggs seldom sell for less than 25 cents per dozen, and up to 50 cents. Spring chickens bring from 18 to 35 cents per pound; old chickens sell at 12 and 16 cents per pound; turkeys, geese and ducks bring 16 to 20 cents per pound.



IRRIGATION DITCH, SEQUIM PRAIRIE, CLALLAM COUNTY:

M. ASHTON GORE, Selah: From my observation and experience, it is impossible for one to make a living on irrigated fruit lands before the trees come into bearing. But by having small tract (say ten acres) one can cultivate his trees and have a team and do outside work—that is, work for others. Wages here are good—\$2.00 and \$2.25 per day and \$4.50 and \$5.50 for a man with a team.

PROFITS FROM IRRIGATED LANDS-

While a great many motives may be cited as contributing to induce men to seek a change in their home location, undoubtedly the final decision is influenced in nearly every instance by the possibilities ahead for financial betterment. There is small object for any person to migrate across a continent unless he may anticipate with reasonable certainty an improvement in his material welfare. Such advantages as a desirable climate, beautiful scenery, opportunities for hunting and fishing, educational and social opportunities, etc., all make their appeal, but the question, "Can I better my condition?" must be satisfactorily answered in behalf of any section that is seriously desirous of adding to its home-making population.

Fortunately for those who will inquire deeply into this phase of the situation, farming by irrigation is not a new or untried industry in this state. Back in territorial days, men were acquiring competences through the application of water to the arid valley lands of eastern Washington, and in the interim that has elapsed since that time many of them have attained comfortable fortunes. The experiences of those who pioneered the way are available to the newcomer, and in the light of such experiences he may determine to some extent, at least, the possibilities for success that await his own efforts.

The essential difference between the early days and the present time is found in the fact that reclamation work is now proceeding on a vastly larger scale. Land is being brought under ditch and made available for cultivation by tens of thousands of acres and is lying now, fat and fallow, waiting the coming of the industrious husbandman. In the meantime, some idea of what is being accomplished by men who have already brought their lands to a producing basis may be gleaned from the following reports, supplied on request, by individual irrigation farmers and orchardists.

INDIVIDUAL REPORTS.

H. C. LARSON, near Vineland, in Asotin county: Size of tract, five acres; planted to grapes, strawberries, dewberries and peaches. For the season of 1909 the above tract yielded 990 boxes of peaches and 1,000 crates of grapes; the total expenses for the season amounting to \$550.00 and the net profits were \$1,341.00.



AN IRRIGATED ORCHARD, SEQUIM PRAIRIE, CLALLAM COUNTY.

J. B. LORER, owner and PETER SPOHN, operator, of seven-acre tract, located near Clarkston, Asotin county: The tract is cropped in vegetables, and during the past four years 800 loads of manure have been spread over the seven acres. For the season of 1909 the total sales from the above tract amounted to \$5,340.00; the total expenses, including water, taxes, feed, express, boxes, sacks, labor and commissions amounted to \$2,125.00, and the net profits were \$3,225.00.

H. W. DESGRANGES, near Kennewick, Benton county: Size of tract, ten acres; planted to alfalfa. For the season of 1910 the above tract yielded a net profit of \$540 over and above expenses.

OMAR W. RICH, Kennewick, Benton county: Size of tract, five acres; planted to cherry, peach and pear trees; the trees, of which there are 400 in the tract, are six years' old. For the season of 1910, Mr. Rich marketed 1,300 boxes of fruit, at a total expense of \$500.00; his net profits for the season were \$1,000.00.

G. L. FINLEY, Kiona, Benton county: Size of tract, three acres; planted to apples, peaches and pear trees. There are 325 trees in the tract, only a portion of which, however, are bearing, as some of them were put in two years ago. For the season of 1908 Mr. Finley sold 400 boxes of apples from 45 trees, which brought him a net profit of \$200.00.

S. E. MORICAL, Entiat, Chelan county: Size of tract, two acres; planted to a general variety of winter apples. There are 200 ten-year-old trees in the tract. For the season of 1908 the yield from the tract amounted to 1,800 boxes; the total expenses amounted to \$450.00, and the net profits were \$1,800.00.

J. H. BLAKE, Wenatchee, Chelan county: Size of tract, one acre; planted to Winesap apples. There are 96 trees in the tract, which was planted ten years ago. For the season of 1909 Mr. Blake sold 960 boxes of apples from his one acre at an average price of \$2.40 per box. He estimates his expenses for the season at \$600.00 and his net profits slightly over \$1,700.00.

BLACKMAN BROTHERS, near Wenatchee, Chelan county: Size of tract, 36 acres; planted to apples. The trees, of which there are 2,880 in the tract, are eight years' old. For the season of 1909 the yield from the above tract amounted to 18,000 boxes; the expenses for the season were \$6,000.00, and the net profits \$21,500. In common with other fruitgrowers, Blackman Brothers report 1909 to have been decidedly an "off" year.

GEO. SPENCER, location on the Entiat river, 7 miles from the Columbia: Size of tract, twelve acres; planted to apples and peaches; apples include Winesaps, Winter Bananas and Spitzenbergs. There are 800 six-year-old trees in the tract. For the season of 1909, when the trees came into bearing, Mr. Spencer marketed 700 boxes of apples at a net profit of \$650.00.

JOHN N. JOHNSON, near Wenatchee, Chelan county: Size of tract, seven acres; planted to apple trees not yet bearing. Timothy, clover and alfalfa grown between the trees yielded at first cutting for season of 1910, 14 tons, which brought \$19.00 per ton exclusive of hauling. Two additional cuttings were made, but returns not reported.

J. L. DUMAS, Touchet valley, Columbia county: Size of tract, one hundred acres; planted to winter apples; number of trees in tract, 7,500. For the season of 1907, the above tract yielded 24,000 boxes of apples, giving net profits of \$24,000; for 1908, the yield was 35,000 boxes, with net returns of \$20,000; in 1909 (a poor fruit year), the yield amounted to 17,000 boxes, with a net profit of \$12,000. Mr.

Continued

MITCHELL STEVENS, near Ellensburg, Kittitas county: Size of tract, 39 acres; planted to timothy and mixed timothy and alfalfa. For the season of 1909, the yield from the above tract amounted to 110 tons of hay, selling at \$19.00 in the stack, and 16 tons which brought \$12.00 per ton. The total returns amounted to \$2,282.00.

A. C. LIBBY, Methow valley, Okanogan county: Came to the valley in the fall of 1888—myself, wife and three babies. Filed on 160 acres of land in the Methow valley where Libby creek joins the Methow river. Have cleared up my ranch, and to last spring (before the time of its sale) put 120 acres under irrigation—of this amount about 60 acres into alfalfa, about three or four acres into bearing orchard; the balance of the ranch given up to growing grain and some corn. Our first apple tree was planted twenty-one years ago this fall, and since the year it first came into bearing has had a good crop of apples every year. There never has been a year when the tree has produced below a normal yield from any cause whatever. The greater part of our orchard was planted twelve to fifteen years ago. The yield as well as the quality of apples grown compares favorably with anything I have ever seen in the Wenatchee country. My experience of twenty-two years in the Methow valley leads me to believe it is destined to be one of the greatest apple-growing sections in the world. I cut three crops of alfalfa hay each year, averaging from five to six tons per acre; corn yields from 40 to 60 bushels; oats, about 60 to 75 bushels per acre; wheat, from 30 to 40 bushels per acre. Climatic conditions in this part of our state are ideal; practically no winds at any season of the year; winters are mild, with plenty of snow to insure a sufficient amount of water during the entire irrigation season. Outside of a small strip of land along the valley, the greater portion of this section is included in forest reserve. This insures us unlimited fuel, as well as timber for posts and building purposes for the next generation. There is plenty of room for men who desire to engage in general farming, stockraising or fruitgrowing.

S. A. FERREL, 12 miles east of Walla Walla: Size of tract, 10 acres; planted to apple trees; varieties, Newtown Pippins, Ben Davis, Spitzenberg, Rome Beauties, and Jonathans. There are 1,000 trees in the tract, averaging twelve years in age. During the past three seasons, 5,680 boxes of apples were marketed from the tract, the total expenses for the period being \$1,800 and the net profits \$3,406.00.

C. M. RADER, Lowden, near Walla Walla: Size of tract, 150 acres; principally in alfalfa and pasture. The farm is rented on half shares, and for the season of 1909 the net returns for one-half share, exclusive of interest and taxes, amounted to \$1,831.50.

ERNEST C. HILL, tract of 20 acres located near Selah: Planted to apples, peaches, pears, cherries and prunes; varieties of apples as follows: Spitzenberg, 300; Arkansas Blacks, 100; Ben Davis, 100; Gravensteins, 100; Kings, 100; also some Newtowns. Age of trees, 14 years. For the season of 1909, Mr. Hill sold 2,000 boxes of fruit; his total expenses amounted to \$1,542.33, and his net profits from the season's operations were \$2,892.20. His carload of Spitzenbergs exhibited at the Spokane apple show was awarded second prize.

E. C. VAN BRUNDT, Fruitvale, two miles west of North Yakima: Size of tract, 40 acres; planted to apples, peaches and grapes; 800 bearing apple trees and 1,000 bearing peach trees; the apple trees are 10 to 12 years' old and the peaches 4 to 10 years. For the season of 1908, Mr. Van Brundt marketed 6,300 boxes of apples, 9,400 boxes of peaches and 3,000 baskets of grapes. His total expenses for the season amounted to \$4,800.00, with net profits over and above expenses of \$7,200.00.

Individual Experiences

TABULATED STATEMENT SHOWING COST OF PLACING RAW LAND IN CROP.

NOTE: Each line of the accompanying tabulation represents the report of an individual grower.

County.	Postoffice.	Size of tract in acres.....	Clearing.....	Plowing.....	Scraping.....	Leveling.....	Planting.....	Cost of seed or trees.....	Ditching.....	Other expenses	Total cost.....	Average cost per acre.....	Remarks.
Asotin.....	Vineland.....	5	\$10 00	\$15 00			\$50 00	\$145 00			\$225 00	\$45 00	Planted to peaches, berries and grapes (1,400 vines).
Asotin.....	Vineland.....	15		22 50			100 00	325 00			547 50	36 50	Planted to peaches and cherries
Benton.....	Kennewick.....	30	30 00		\$60 00	\$80 00	60 00	718 50	\$100 00		1,468 50	48 95	Planted to orchard and grapes.
Benton.....	Kennewick.....	40	120 00	100 00		190 00	280 00	897 00	1,108 00	85 00	2,841 30	71 08	Planted to orchard—Ditching includes a pipe line.
Benton.....	Prosser.....	11	24 00			125 00	24 00	85 00		55 00	313 00	28 45	Planted to apples.
Benton.....	Kennewick.....	10	30 00	22 50		100 00	22 50	25 00			200 00	20 00	Planted to alfalfa. [pear trees.
Benton.....	Kennewick.....	5	15 00	5 00		24 00	30 00	200 00	15 00	50 00	349 00	69 80	Planted to cherry, peach and
Chelan.....	Entiat.....	15	150 00	45 00			30 00	225 00	200 00		650 00	43 33	Planted to winter apples.
Chelan.....	Wenatchee.....	36	108 00	72 00			108 00	360 00	108 00	144 00	900 00	25 00	Planted to apple trees.
Columbia.....	Dayton.....	6		20 00		10 00	22 50	165 00	22 00		230 50	39 91	Planted to apples and peaches.
Douglas.....	Wenatchee.....	40	80 00	160 00			240 00	810 00		600 00	1,890 00	47 25	Planted to apple, peach and apricots.
Garfield.....	Pomeroy.....	25	150 00	25 00	25 00	15 00	25 00	45 00	500 00	200 00	985 00	39 40	Planted to orchard and alfalfa
Okanogan.....	Omak.....	37	166 50	92 50		370 00	200 00	200 00	500 00	150 00	1,479 00	39 90	Planted to apples and wheat.
Okanogan.....	Brewster Flats.....	10	30 00	10 00	10 00	10 00	40 00	140 00	50 00	10 00	280 00	28 00	Planted to apples and peaches.
Okanogan.....	Omak.....	40	90 00	90 00	100 00	50 00	175 00	600 00	50 00	135 00	1,200 00	30 33	Planted to general orchard.
Spokane.....	Otis Orchards.....	20	130 00	70 00		15 00	70 00	338 80			588 80	29 44	Planted to general orchard.
Spokane.....	Otis Orchards.....	13.3	70 00	78 00	20 00	20 00	54 00	280 00		20 00	522 00	39 25	Planted to general orchard.
Spokane.....	Spokane Bridge.....	10	100 00	60 00		10 00			5 00	20 00	195 00	19 50	Expense of trees and planting not shown.
Spokane.....	Otis Orchards.....	12		39 60		15 00	36 00	240 00		100 00	480 60	35 88	Planted to apple trees.
Walla Walla.....	Two Rivers.....	5	12 50	12 50		5 00	25 00	19 50		11 75	91 25	18 25	Planted to trees and garden.
Walla Walla.....	Walla Walla.....	14	70 00	17 50	5 00	350 00	30 00		25 00	37 00	529 50	37 82	Planted to general garden.
Yakima.....	North Yakima.....	10	50 00	50 00		150 00	50 00		50 00	10 00	390 00	39 00	Planted to apple trees.
Yakima.....	Grandview.....	20	100 00	40 00		300 00	50 00	320 00			820 00	41 00	Planted to orchard.
Yakima.....	Mabton.....	15	75 00	37 50		225 00	60 00	240 00	15 00		682 50	43 50	Planted to orchard and alfalfa
Yakima.....	Sunnyside.....	2	6 00	5 50		1 00	1 50	4 50	1 00	29 50	49 00	24 50	Planted to tomatoes.
Yakima.....	Mabton.....	7	35 00	17 50		93 75	7 00	3 00	50 00	10 00	166 75	23 82	Planted to alfalfa.

SUMMARY.

Number of counties represented..... 10
 Number of tracts considered..... 26
 Total acreage..... 453.3 acres
 Average size of tracts..... 17.43 acres

Average cost of placing raw land in crop, including clearing, plowing, scraping, leveling, planting, cost of seed or trees, ditching and other incidental expenses..... \$39.66 per acre

